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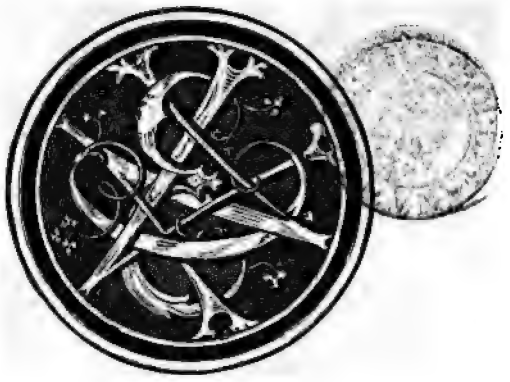

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PERISCOPE.

THE VETERINARY REVIEW

AND

Stockowners' Journal.

ORIGINAL COMMUNICATIONS AND CASES.

Cases of "Parturition Apoplexy," "Puerperal Fever," or "Loin Fallen." By W. A. CARTWRIGHT, M.R.C.V.S., Whitchurch, Salop.

Case 1.

EARLY on the morning of the 16th October 1840, an Ayrshire cow, five years old, the property of Mr Joyce of this town, calved. It was a breech presentation, with one of the hind legs down, but which was got up; and the calf was extracted in that position.

In the course of the day she fed well, and was half her time standing up; but in the afternoon she began to totter, and about 6 o'clock she fell down.

Soon after, I was sent for, and found her down in a very helpless and restless state, with her head to her side, and breathing short, and gasping for breath. With a little assistance, she soon after got up, but soon came down again. Her pulse was very feeble, but not much quicker than natural. Horns warm. About the hips the parts seemed flabby and puffed. She was straining, and only part of the placenta had come away. I did not think it prudent to bleed her, considering the state of the pulse and the symptoms.

Treatment.—Gave Mag. Sulph., ℔ss; Ol. Ricini, Oj; Ol. Croton, guttæ x; Sps. Tereb., ℥ij; Pulv. Zingib., ʒij; Opii ʒj, in some gruel; blistered the spine, and fomented the parts behind. In two hours after, she rallied a little, and sat up pretty cocket, with her head from her side. Her difficult breathing and gasping had subsided.

9 P.M.—Still improving. Gave ʒvj Sps. Æth. Nit., ʒvj Sps. Tereb., and ʒij Ant. P. Tart., in some gruel. Repeat blister. She continued pretty easy most of the night; but about 5 next morning she was as bad as ever, and she lingered in this state till about 2 P.M., when I ordered her to be knocked on the head I forgot to state, that about 6 A.M. I gave her ℥ij Tinct. Opii and ℥j Sps. Æth. Nit. in some gruel, as she was struggling a good deal.

Post-mortem Examination.—There was no constipation in the *third stomach*, nor was there any inflammation, or anything that I thought was disease, in any part of the contents of the abdomen. The

spine was split up in the usual rough way, but I could not detect any effusion. At last I thought that I had made a grand discovery in finding a large piece of coagulated blood on the cord, about the first, second, and third cervical vertebræ; but, on second consideration, I have no doubt it was produced by the blow on the brain, as I have seen it in several instances since.

Case 2.

On the 2d May 1842, an aged cow of Mr Churton's, of this town, calved. She was very fat, and had an immense udder. At night she was left well.

3*d May*.—This morning about 6 o'clock, the man found her down and unable to get up. I saw her soon after. Pulse small and quick. Respiration natural; and there seems little the matter with her, except being unable to get up on her hind parts. She can rise up on her fore ones, and sits up as well as usual, and keeps her head well up.

Treatment.—Took six quarts of blood from her, which came away in a very full stream; gave a purging drink, stimulated the spine, and had her removed into a hovel.

10 A.M.—I fancy she has not so much power in her fore extremities, and I think her head totters more about; but she does not lay it to her side. Gave Ojss of Ol. Ricini. She has even now a difficulty in swallowing.

4 P.M.—Is worse, and appears in a good deal of pain, as she is restless, and moves her legs up and down, as if it were in her bowels. She tries to turn over. Has decidedly less power in supporting her head; for when she lifts it up it rolls about, and she then drops it on the ground, or lays it to her side. With very great difficulty she turned over and lay on the opposite side, and I think I can hear as if some bones were rubbing on each other about the loins or pelvis. Is tolerably warm, and her pulse is distinct. Gave ʒij Ant. Potas. Tart.

10 P.M.—She is decidedly sinking. Pulse very indistinct; and she is colder. Gave ℥iv Brandy and ʒij Camphor.

4*th*, 8 A.M.—About the same, but if anything a little more lively in appearance, and her pulse, I think, is more distinct. Has dunged a small quantity.

10 A.M.—Better. Is warm. More lively; and has dunged twice, which is tolerably soft. Gave ℥j Sps. Tereb., ʒjss Ant. P. Tart., and ℥xij Ol. Ricini. Has altered her position. Udder soft.

12 M.—Worse. Makes a noise as if some of the drink had entered the trachea.

5 P.M.—Respiration very quick. Is warm all over; and udder soft. Has scarcely the power of raising her head now, and if lifted up it unconsciously falls on the ground. One can move one's finger on the eye without her feeling it. I could not introduce the catheter. Dung soft. Pulse scarcely to be felt at the chest, and not at all at the jaw. Gasps for breath through the mouth. Hind legs are quite stiff and stretched out.

5th.—This morning about 3 o'clock she was killed, as she appeared almost dead.

Post-mortem Examination.—The third stomach was full, but the contents were not hard, but becoming a little so from heat of body. The other stomachs were not above half filled, and their contents were soft. Nearly the whole of the intestines were inflamed. The small ones, for three or four yards, were highly so on the mucous coat. The larger ones were not so much inflamed, but were more speckled and streaked. The uterus, on its inner membrane, was coated with some lymph and serum, and was contracted and hard; but I don't think it was more diseased than naturally, or after calving. Lungs a little congested. Spinal cord, as far as I could examine it, was sound, and I could not detect any effusion; but I was not satisfied with the examination, as it was only split up by the butcher.

Case 3.

On the 29th July 1843, about 11 A.M., an eight-year-old cow, in fair condition, but not by any means fat, the property of Mr Joseph Evanson of this town, calved in the field and required but little assistance; and soon after she ate a bran-mash, and in the afternoon some grass.

10 P.M.—She was seen, and would not then eat or drink; and in the course of the night she got worse, and lay down, and could not get up again.

30*th*, 5 A.M.—I first saw her, and she had then every symptom of being "loin fallen"—throwing her head about and to her side, and could not rise.

6 P.M. *Treatment.*—Gave ℔j Soda Sulph.; P. Zingib., ℥j; Sps. Æth. Nit. et Sps. Gent., āā, ℥ij. From the milk-vein on the near side I took five quarts of blood, and rubbed on the loins and spine occasionally a blistering liniment. The medicine caused a deal of flatus to be belched up.

8 A.M.—Seems in pain in her bowels. Gave ʒj Ol. Croton; ʒij Ant. Potas. Tart.; Ol. Ricini, Oss; Sulphur, ℥iij; Pulv. Lyttæ, gr. xv.

2 P.M.—She is easier, but she still throws her head about and to her sides; but I think she is better, as she steadies her head a little firmer. Is very warm and comfortable all over, and she has drawn her legs close to her body, and moves them occasionally. Sent ʒj Ol. Croton and ʒiss of Ant. Potas. Tart., to be given at twice. Mustard applied to the loins and spine. From the last date she gradually got worse and worse, and died sometime in the night. I saw her about 9 P.M., she was then all at full length and breathing most laboriously, and I could hear liquids working up and down the trachea, and I ascertained that what gruel had last been given to her she had a difficulty in swallowing—indeed she really did not swallow, it merely ran down anywhere.

Post-mortem Examination.—The *first stomach* was tolerably filled

with moist food, and I could see some of the sulphur interspersed amongst it. The *second stomach* was empty. The *third stomach* was full, but no part of it was hard or constipated; and that part towards the œsophagean canal was very pultaceous, and evidently showing the effects of the medicine—indeed the medicine appeared to have produced disease about them, as there was extravasation of lymph and serum within its coats, and appeared quite dropsical. The *fourth stomach* was nearly empty, and showed some vestiges of the probable injurious effects of the medicine in a similar way to what the mouth of the third stomach did. The *small intestines*, for about half way along them, were tolerably sound, with the exception of some slight patches of inflammation on their mucous coat. The remaining part of the small intestines was very much diseased, being in some places highly inflamed and of a dark-red colour; in other places there were patches of inflammation. The intestines contained liquid of a dirty-red colour. Some parts of this intestine were streaked of a blackish colour. The *large intestines* were tolerably healthy, and contained but little fæces, and which were not hard. The *lungs* were a little congested.

Head and Spine.—I had these sent home for examination. There was nothing particular about the brain, except that the ventricles of the cerebrum had too great a quantity of serum in them; and on separating the head from the spine, a large quantity of serum ran out from the latter. I then exposed the whole of the spinal marrow, and found that the cervical portion of it and opposite the first four or five dorsal vertebræ were pretty natural; but from this place throughout the remainder of the spinal cord there was a very large quantity of serum within the theca vertebralis, and especially so about the dorsal and lumbar vertebræ. About the lumbar vertebræ the cord had a few dilated bloodvessels on it, and more so than on the other parts. On each side of the external surface of the theca vertebralis there was a vein, as large as a goose-quill, completely distended with black blood, and one would have supposed would have caused great pressure on the cord.

Case 4.

About 6 A.M., April 16, 1844, I was called in to an aged cow, belonging to Mrs Jones of the White Lion Inn in this town, that was "loin fallen." She calved yesterday, and was left at night as well as could be expected, and had no symptoms then of the disease. She was very fat. She now attempts to rise, but cannot; moves her hind legs up and down, and looks lively. *Treatment.*—Took 7 quarts of blood from her, and gave ℥xij Soda Sulph.; ʒj Ol. Croton; Pulv. Lyttæ, ℈j; Pulv. Zingib., ʒvj; Sps. Gent., ℥ij; and rubbed a quantity of mustard all along the spine, and covered her well up.

12 M.—Is warmer, but no better. Gave Soda Sulph. et Sulphur Sub., āā, ℥iv; Ol. Croton, ʒss; Sps. Gent., ℥ij; Pulv. Zingib., ʒiv; and rubbed a liniment composed of Lin. Lyttæ et Sps. Tereb. on her loins.

4 P.M.—Is decidedly worse. Bowels not moved. She now begins to hang her head to her sides, and cannot move her hind legs so well. About this time she drank a few draughts of water. Pulse not very quick. Horns not quite so warm. We turned her over and got some milk from her udder at intervals.

5 P.M.—Gave her Tinct. Opii; Sps. Æth. Nit., āā, ℥iss. Lies at full length.

6 P.M.—Still lying at full length. Turns her head sometimes to her side. Is warm all over. Does not look any worse. Gave her a clyster, with ℥j Sps. Tereb., and a handful of salt in it; and when giving it, she strained a little, and also stretched her hind legs out from her body, thus showing that all muscular power was not gone.

7 P.M.—Repeated the last drink. The other appeared to have produced perspiration very freely.

9 P.M.—Worse. Cannot lift her head up. Pulse quicker and small. Will bear the eye pressed. Respiration all along has been too quick. Bowels not moved. Has a difficulty in swallowing.

11 P.M.—About the same. Lifted her head up, but it soon fell to her side again. Blisters taken no effect. Bowels not moved. Gave ℥ij Aloes Cape; ʒss Pip. Cayenne; ℥j Pip. Jamaica; ʒij Ant. Potas. Tart., all having been boiled in some linseed gruel. Has great difficulty in swallowing. Seeing next morning that there were little hopes of her recovering, she was slaughtered for meat, being very fat; and I am sorry to say I did not see her opened, but I was told that the third stomach was not at all constipated.

Case 5.

About 8 o'clock A.M., Feb. 13, 1845, a cow, in excellent condition, of the Jersey breed, the property of Thomas Groom, Esq., surgeon, of this town, calved without assistance, and afterwards fed well and cleansed.

On the morning of the 14th she was also well and suckled the calf, and gave more milk after; but about

1 P.M. she was again seen, and found to be down and ill; and with some little difficulty she got up, but was soon down again.

3 P.M.—I saw her for the first time. She was down. Pulse at the jaw small, but at the shoulder I could feel it more distinctly, and it was not above the natural rate per minute. Was not swollen. On attempting to move her from an unfavourable position, she with great difficulty got up without assistance; but when up she was very weak, and soon after dropped down on the opposite side.

As I had hitherto been foiled in curing these cases by the antiphlogistic treatment, I was determined to try the opposite one. I accordingly gave Sps. Æth. Nit., ℥ij; Tinct. Opii, ℥ij; Sps. Gent., ℥j. In half an hour after, I thought it prudent to give her Soda Sulph., ℔j; Ol. Croton, ʒj; Zingib., ℥ij, in some gruel. The first medicine caused the expulsion of a good deal of wind from the

stomach. Had her well covered up. Seems in pain, and struggles with her legs.

6 P.M.—About the same. She has either been up, or has struggled about the cowhouse. Horns and ears coldish. Is very heavy about the head. Gave Sps. Æth. Nit., ℥ij; Sps. Gent., ℥j; Tinct. Opii, ʒvj; also Sulphur, ℔ss; Aloes Bbds., ℥j; Ant. P. Tart., ʒij; Pip. Jam., ℥j. A pretty good dose, some will say, but I thought prudent to give it whilst she could swallow. Rubbed ℥v of strong Mustard and ℥v Sps. Terebinth. on the spine, and clothed her well up. She had a difficulty in swallowing the gruel and medicine, even at the first time of drenching. Respiration tolerable, but at times it is stertorous. We at this time drew a little milk from her. During part of the night she was very restless; but about two o'clock in the morning she became quite warm, and the person sitting up with her said she chewed her cud for a quarter of an hour, and kept her head straight out before her, and he thought she was getting well fast. Strongly stimulated the loins in the night.

15*th*, 8 A.M.—I saw her again. She was uncovered, and cold all over. Head at full length before her, and unable to move it. She can scarcely swallow. Has dunged in the night, which was soft. I now drew six or seven quarts of urine from her, and gave her ℥ij Sps. Æth. Nit. and ℥j Tinct. Opii. I fear the result. She is much more swollen. Struggles. Pulse at the jaw feeble, but at the chest more distinct, and scarcely quicker than natural.

12 M.—Seeing no amendment, or the probability of her getting better, she was killed and made meat of.

Post-mortem Examination.—The first stomach was not by any means full or overloaded. The third stomach was full, and there was no appearance of "staking" in any part of it, but on the contrary, it was becoming pultaceous, and no doubt she would have soon purged had she lived. The fourth stomach was not inflamed, nor showed any disease. The folds of this stomach were the largest I ever saw, being 4 or 5 inches in depth, but they are always larger in aged cows. *The intestines.*—Those proceeding from the stomach, for half way along, contained a good deal of chyle or mucous secretion, and the other portion had much more liquid fæces in them. The *large ones* contained fæces of a more solid nature, but there was no constipation, and there was but little inflammation in any part of the whole tract of intestines. The *brain* could not be examined, having been injured by the butcher, and the *spine* he also split up, but it was not materially injured. There was no extravasation of blood or lymph within or external to the theca vertebralis. There were streaks of filled bloodvessels on the surface of the spinal cord, but more so across the loins, but whether more than natural I cannot say. The interior of the spinal cord was softer and of a darker colour than the cortical portion, which was quite white.

The Uterus, &c.—The uterus was larger and harder I fancy than usual, after such a period from calving, and about its neck was of a

very dark colour; and on closely examining it, I found that there was a good deal of extravasated blood in the cellular membrane, and a little on the surface of the vagina, a little posterior to the os uteri. The body of the uterus was decidedly much thicker than it should be, and lay contracted in considerable wreaths lengthways. There was also some extravasation of blood within the pelvis external to the uterus. On cutting into the substance I found, especially around the fundus, a large quantity of serum and lymph, but there was no deposit of blood, or of the appearance of the bloodvessels being congested.

Case 6.

On Friday, March 23, 1848, a cow, ten years old, cross bred, the property of Mrs Currie, calved.

24*th*.—This morning she fed, and seemed pretty well. About 10 A.M. she was weaker, and tottered about a little. At 12 M. she was turned out of the cowhouse to go into the field close adjoining, but on doing so she staggered and fell. At 2 P.M. I saw her, and she had then every symptom, in its first stage, of being "loin fallen"—viz., inability to rise on her hind parts; a tottering of the head; moaning; pulse almost imperceptible; and there appeared to be a laxity and looseness of the spine, and joints about the loins and pelvis. As I hardly ever knew a case to get well about here, no matter whose hands they had been under, I advised them to dispose of her.

At 7 P.M. she was slaughtered, and being night I could not trace disease as I could wish. The third stomach was quite full, but there was not the least appearance of "staking" in it, and apparently there was nothing unusual about the internal parts. On the external parts, about the lumbar vertebræ, there was a good deal of extravasated blood, but most probably it was produced by her falling against something.

27*th*, 6 A.M.—I saw the spine sawn through, but I could not detect the least effusion or disease on the cord, and the bruise on the loins was quite superficial.

Case 7.—*Cure.*

A cow, eight years old, the property of A. Worthington, Esq. of the Mount, in this town, calved on January 25, 1853. At night the placenta was expelled. Is in good condition, and has a very large udder, and calved without assistance early in the morning before the family got up. On the morning of the 26th she was thought not to be so well, being weak and tottering. About 11 A.M. I saw her. Is standing up, and there are slight muscular tremours. Pulse about its natural standard, but feeble. Udder large, and she gave this morning about two quarts of milk, more than the calf required. She is weak, and totters in her hind parts. As she stood up to the wall, and close to the door, I thought it better to remove her into another stall, more in

the middle of the cowhouse. In doing so she manifested great difficulty in walking, and had a narrow escape of falling head-foremost into the "boosy." She has, in short, every symptom of approaching "loin fallen." ℞ Soda Sulph., ℥xij; Ol. Croton, guttæ xl; Aloes Capen, ℥ij; Pulv. Capsici, ʒij; Pulv. Zingib., ℥ss; one-half to be given in some gruel immediately, and the remainder in an hour's time. Mustard-paste was rubbed over the spine, and in the afternoon a strong liquid blister was also applied.

3 P.M.—The animal is down and moaning. Pulse about natural. Has not dunged. Paunch and abdomen distended.

8 P.M.—Lies with her head to her side; but she is sensible, and can move her head straight out, but it soon falls to her side again. Gave her Soda Sulph., ℥iv; Aloes Barb., ℥j; Ol. Croton, guttæ xx; Pulv. Capsici, ʒij; Pulv. Zingib. et Gentian, āā, ℥j. This medicine was well macerated before it was given to her, and she gulped it down.

27*th*, 9 A.M.—She is still down, and has not been up since she first went down. Is sensible, and can move her head a little about, but it generally lies on her side. Pulse and respiration natural. Skin warm. Bowels not acted on. Gave Pip. Jam., ℥j, (that had been macerating all night;) Ol. Croton, ʒss; Ol. Ricini, ℥vj. I poured some hot water along the spine from a tea-kettle, and she was evidently sensible to the application, as it gave her great pain, and made her turn over on the other side. Rubbed some brandy on her loins.

5 P.M.—The symptoms are more favourable, or at any rate they are not worse. Has not yet been up. On passing my hand up the rectum I withdrew a quantity of hardened fæces. Although I do not think it of much use, generally speaking, to back-rake or clyster cows, yet I think in this disease it is proper to remove any fæces, as they may press on the nerves supplying the hinder extremities. Sits with her head out before her. Does not moan. Has urinated. On raising her up a little she strained to force the dung out, which I consider a favourable symptom. Several quarts of milk have been drawn from her during the day.

9 P.M.—On going to give her more medicine, the man found her up.

28*th*, 9 A.M.—On my visiting her I found her up. Udder soft; and the calf had sucked her freely, by which the udder was very much reduced in size. She looks more lively, and now carries her head straight out before her. Has voided dung once, which is softer, but still mixed with some that is hard. Give some Ol. Ricini, with some Pip. Jamaica every hour or two, and allow nothing but gruel and water. Legs to be well rubbed, as she seems weak and shuffling behind. Applied some more brandy and mustard to her loins. From this time she got better, and was soon all right again.

Case 8.

On the 13th March 1858, a cow, ten or eleven years old, the pro-

perty of C. Clay, Esq. of this town, calved with great ease, and soon after cleansed. She continued well and fed well on the 14th, and ate her feed of hay in the night of the same day. On the morning of the 15th the servant found her down when he went to see her. I was then sent for. *Symptoms.*—Could not get up, and seemed very weak in her hind parts. She sat up, and looked pretty well about the eyes. Pulse and respiration about natural. She was full of food, but not swollen of any moment. I gave her Mag. Sulph., ℔j; Sulph. Sut., ℥iv; Ol. Croton, guttæ xx; Pip. Jam., ℥ss; Sps. Æth. Nit., ℥j; Aqua Vitæ, ℥iv, and she swallowed it well. Blistered spine, and covered her well up.

12. M.—Her head is heavy, and is partially laid to her side—indeed she has now every symptom of being "loin fallen."

I now boiled ℥ss Pip. Jam., ℥ss Pulv. Zingib., ʒj Pip. Capsici in some water, to get the strength out of it, and gave half of it, and ℥iv of Brandy and ℥j Sps. Æth. Nit., and the remaining dose two hours after.

6 P.M.—Worse. Bowels not open. Gave ℥j of melted Aloes and ℥j Sps. Æth. Nit., and more pepper stimulants and brandy.

8 P.M.—About the same, or worse if anything, yet she is pretty warm. Gave ℥j Aloes and more stimulants, and clothed her up, and left her for the night.

16*th*, 7 A.M.—About the same. Nothing has come through her. Gave more opening and stimulating medicine. Raked her, and drew seven quarts of urine from her.

12 M.—About the same. The owner would have her killed, and he sold her for £2 to a butcher for meat, sadly against my will, although her recovery was very uncertain.

Post-mortem Examination.—The *first stomach* was pretty full of moist food. The *second stomach* was half full, but its contents were nearly liquid. The *third stomach* was quite full, and one-half of its contents was hardish, but not so dry as I have seen it, but still it was too dry. The remaining part that was in it, about its mouth, was pretty soft. The *fourth stomach* was nearly full, but what was in it was nearly liquid. There was not the least appearance of any inflammation in any parts of the stomachs. The *small intestines* were nearly empty, and there was no appearance of them being inflamed. The *large intestines* were moderately filled, and they were quite sound. The lungs and heart were pretty natural; the former, perhaps, were a little redder than natural in one or two places, most likely from some of the medicine having passed down the windpipe. The head and spine could not be examined.

There was a little effusion of lymph between the stomachs and diaphragm. Of course these are cases that require more minute examination of the head and spine, but certainly the abdominal viscera was quite sound, and I cannot say I ever saw one more so in this complaint.

Case 9.—Cure.

About 3 o'clock A.M., September 19, 1860, a large half-bred cow, six years old, and very fat, the property of Miss Dymocke of this town, calved, and soon after she parted with the placenta, and fed and appeared well all day.

20*th*, 6 A.M.—She was discovered down, and could not get up, and also had, as the man in care of her said, "her reid down," (uterus.) I saw her at 7 A.M. *Symptoms.*—She was tied up at the stake, and lying down with her head to her side. She could not get up, and had every symptom of being loin fallen. Her "bulk" or vagina protruded to double the size of my head, and in the middle of it there was a portion of the uterus as large as my head. I returned the protruded parts, and put four sutures through the vulva, and raised the hinder parts.

I commenced giving her, about every hour, ʒij of the Sesq. Carb. of Ammonia in water, and continued it until she had had six doses.

About 4 P.M. I gave Ol. Croton ʒss.; Hydr. Chlorid., ʒij.

7 P.M.—Gave another dose of the Ammonia, with ℥vi of Brandy. She has lain most of the day in a perfectly helpless state, and most of the time she has had her head to her side. Respiration has been quicker than natural, but not particularly stertorous, and she has been quite warm all day. Has had some little difficulty in swallowing, but I have seen many swallow worse. Bowels not opened. There has been but little bearing down from the uterus.

9 P.M.—About the same. Is quite warm, and perfectly helpless Eyes are sinking. No particular protrusion of the vagina. We now turned her over, and I left three more doses of the Ammonia and ℥xij of Aqua Vitæ to be given in the night; but as she was swollen a good deal, I thought it prudent before I left to "tap" her.

21*st*, 6 A.M.—I have been informed that she remained about the same all night. Is warm. Bowels not opened, and the tapping has kept the swelling down. Breathes too quick. Has had difficulty in swallowing. Turned her over, and to be left alone.

2 P.M.—Has been struggling a good deal. Is warm and sensible, and has had another half-pint of brandy. We lifted her head up, and she drank about six quarts of cold water. Has voided her urine well this morning, and there is no swelling from the vulva. The trochar has been out all day, but as she was a little too full I tapped her again. Respiration better after being tapped. Blistered spine, gave an aperient, and left alone.

8 P.M.—Is better, and the symptoms more favourable.

22*d*, 9 A.M.—Is lying all at full length, but she is warm, and is evidently more sensible. Urinates and dungs a little. We pulled her up on her side, and she sat up very fairly and drank some water. Is decidedly better. Gave her some more opening medicine, chloride of lime, and half-pint of brandy.

1 P.M.—Progressing favourably. Gives a fair quantity of milk.

2 P.M.—Is all at length, and seems worse now, and more swollen I again tapped her, which relieved her very much.

6 P.M.—She got up. Gave her some Ol. Lini. et Ol. Castor.

23*d*, 9 A.M.—Got up again. Is warm and more lively. Ate some bran-mash, and drank some gruel and water. Bowels lax.

5 P.M.—Found her down, but sitting with her head up, and looks better. She got up, and gave five quarts of milk. Does not care to eat. Nose dry. Respiration pretty natural. She is, in short, decidedly better, and going on well. Urinated freely. To have a little more oil, and I took the canula out.

24*th*, 9 A.M.—Has been up, but is now down, and sitting quite cocket. Does not care to feed. From this time she gradually got all right, getting up every day, increasing her milk, and ultimately did well, and made a good piece of beef when dry.

Case 10.

A cow, about six years old, of the Jersey breed, very fat, the property of Thomas Groom, Esq., surgeon, of this town, calved at 11 o'clock P.M., September 22, 1860, and cleansed soon after. She calved quite easily, fed well, and was left all right at night.

23*d*.—The first thing this morning, she was apparently all right.

11 A.M.—She was, most imprudently, taken half a mile through the town to the field, and was left there until five P.M. She then was brought home, and it was stated to me that she took her feed at night, and was left the last thing apparently well.

24*th*, 8 A.M.—She was now seen for the first time, and found down, and in an apparent dying state.

9 A.M.—I first saw her. *Symptoms.*—All at length in the cow-house, and almost lifeless. Legs, ears, and the surface of the body cold. Cannot support her head, but dashes it about. Udder very large and hard. Little milk can be drawn from her. I gave half-pint of brandy, and in half an hour after I gave ʒij of the Sesq. Carb. of Ammonia, and to be repeated every hour.

11.—Was swollen. Tapped her.

12 M.—About the same. Gasps as if for life. Does not stir. Gave half-pint of brandy.

8 P.M.—Died. This cow never rallied in the least, and was in a sort of collapsed state all the time. I had not an opportunity of opening her. I should have liked to have done so, as she had had no purgative medicine to produce disease in the bowels, as I am suspicious it does so sometimes.

Case 11.

At 5 P.M., June 13, 1862, a half-bred cow, eight years old, and in excellent condition, the property of Mr Joinson of this town, showed symptoms of parturition. Soon after, the fore feet made their appearance, but no head. Several neighbours were called in, (the

cow was at a farm in the country,) who got the head into its proper position; and with some little force the calf was extracted alive, and all was over by 8 P.M.

14th.—This morning she ate a mash and some hay, and an aperient was given her; and in the course of the morning she was walked into the field for a short time; but even then she seemed weak, and tottered about a little, which was thought to proceed only from the calving.

6 P.M.—The owner called on me now for some more opening medicine, as he said she was staked; and I sent Ojss of Ol. Ricini et Ol. Lini., and most of it was given to her. In the evening she tottered about more than ever, and at 12 o'clock she lay down and could not get up.

15th, 5.30 A.M.—I was called in to attend her, and went three miles to where she was at.

Symptoms.—Those of "loin fallen;" and she seems in pain, and struggles now and then, and throws her head about.

Treatment.—Not having any hopes, from my past experience, in bleeding, I desisted from that, and gave half-pint of Brandy and half-pint of the Liq. Ammon. Acet. in some water, and we had great difficulty in getting it down. Rubbed a blistering liniment on the spine, and covered her well up.

10 A.M.—Is in a very helpless state, and scarcely ever stirs. Lies at full length on the ground, and has not power to shake her head. Ordered half-pint more of Liq. Ammon. Acet. and some Brandy; but she could not swallow nor gulp it down.

6 P.M.—About the same; but breathes laboriously, and evidently has got some of the medicine in her windpipe, &c. I attempted to give her some more medicine, but was obliged to desist, as she could not swallow it. Drew a large quantity of urine from her; but I have very little hopes of her recovery. She continued to get gradually worse, and at 10 P.M. she died.

Post-mortem Examination, 10 A.M.—She was lying on her right side. The first stomach was three-parts full of food, which was moist, and the stomach was healthy; second stomach healthy; third stomach full of well-masticated food, three parts of which was quite soft, and the remainder was getting a little dry, but of little consequence, or indifferent to health. The fourth stomach was a good deal inflamed on its inside. The whole of the intestines were removed out of the abdomen, and on examining them I found that their interior was a good deal diseased, being inflamed and discoloured very much; but as I was in a hurry I could not examine them as I would have wished; but I often suspect that they are diseased in this complaint.

There was great discolouration and inflammation about the spine, on the right side of the thorax; but, as I stated before, she lay on the right side on dying. On looking at the heart, I found that there was some slight ecchymosis in places about the pericar-

dium and heart. The whole of the muscular tissue was very deficient in blood—indeed it was almost bloodless from some cause. The owner said that a large quantity of blood came from the cow, and also from the cord of the calf, which they tied up on the calf being expelled from the womb. The uterus was well contracted and perfectly sound, and the cotyledons were three parts absorbed.

I am sorry I had not time to examine the head and spine. The lungs were very much enlarged and diseased, with effusion of lymph and serum in them, but which no doubt was produced by the medicine getting into them whilst being drenched. I never saw any lungs worse diseased from such a cause, and which shows the absolute necessity of having a stomach-pump with us. She only lived twenty-four hours from the time I saw her, during which time she was in an almost collapsed state.

Case 12.

At 12 M., May 16, 1862, an aged half-bred cow, of Mr Edwards's, Black Park, calved a live calf, and she had a very good time of it and soon after cleansed.

17*th*.—In the morning she gave a fair quantity of milk, and was turned out into the field; but in the course of the morning she seemed to be tottering on her hind legs, and apparently restless, and wandered about the field. About 9 A.M. she came home with difficulty, and fell down in the yard. She afterwards got up, and was taken into the cowhouse. About 12 at noon I first saw her, and she was then lying down in the cowhouse. She appeared to be in pain, and had the usual symptoms of the disease. A butcher had bled her, but he could only get about three quarts of blood from her. I had given to her, Ojss Ol. Ricini et Ol. Lini.; ʒxij Mag. Sulph.; ʒiv Sulphur; Ol. Croton, guttæ x; Zingib., ʒss, and half-pint of Brandy. Covered her well up with bags, and made her comfortable. She had afterwards, at intervals of four hours, three doses of Liq. Ammon. Acet., with ʒiv of Brandy in each dose.

18*th*, 6 A.M.—The owner thought proper to have her killed, and sold her for meat.

Examination, 9 A.M.—The *first stomach* was only very partially filled. Second not examined. The third stomach was not at all constipated, and the medicine was acting well. I slit open some six or eight yards of the small intestines, and they only contained a small quantity of liquid yellowish fæces. On their interior there were, here and there, some specks of ecchymosis, but nothing of much moment; and I am sorry to say that I had not time to examine them in the way I could have wished, as I often fancy, from the pain they have, that they have disease in the bowels. There was not the least vestige of disease in the *uterus*. It was beautifully contracted, and its inner surface was of a pale natural colour, and seemed so throughout its substance. The cotyledons were partially absorbed, and most of them were of the same pale colour.

It contained only about a quart of the usual discoloured secretion.

It was, in short, one of the most healthy I ever saw, and there could not have been any cause here to produce the disease. I did not see any effusion of importance on the spine or cord, but of course these parts were not examined in a proper way, as the spine was merely sawn through by the butcher; but certainly there was no extravasation, to my mind, of any importance. Perhaps there, would have been some congestion, had she not been bled.

Case 13.

On Thursday, April 14, 1864, at 11.30, I was called in to attend a cow eight years old, the property of Mr Newbrook, in Whitchurch, that was down, and could not get up. I was informed that she calved a live calf, about 8 A.M. of the 13th, without any difficulty, and fed, and seemed well all day. Towards 7 A.M. the calf was suckled, and of course she was then standing up, but soon after she went down, and could not be got up, and became worse very fast. An ignorant farrier was in attendance on her, who had taken two quarts of blood from her, and had given some saltpetre "for the water."

11.30 P.M.—I first saw her. She was then all at full length in the cowhouse, with every symptom of being "loin fallen." I took three quarts more blood from her, and gave a purging drink, and blistered her loins, and in the course of the night gave two doses of the Liq. Ammon. Acet. and Tinct. Aconite, and made her comfortable.

15*th*, 8 A.M.—As I did not see the least prospect of her recovery, I advised her to be slaughtered, as the owner was a butcher.

Post-mortem Examination.—She was split up along the spine when hung up, but of course I did not examine her in the way I could have wished; but the bones all about the loins appeared to be saturated with blood, and were of a deep red colour, and very different to the other parts of the spine. *Third stomach* not "staked." *Uterus* perfectly sound and contracted.

There was not the least vestige of disease in the *intestines*. *Lungs and heart* sound. Indeed I could not detect any disease in any part of the carcase except in the spine. The head I could not examine, as it was smashed in being cut off. The spinal cord was injured in being cloven up.

Case 14.—*Cure.*

About half-past 7 o'clock on Friday morning, the 13th May 1864, I was requested to go and see a cow of Mrs Ruscoe's, of this town, that was thought not to be well, and that her bowels were not sufficiently opened.

I saw her immediately, and ascertained that she had calved yesterday morning, and had had a very good time of it, cleansed, and seemed very well all day, and she had given a fair quantity of milk besides what the calf had taken.

She is a very large cow of the shorthorn breed, and in good milking condition, and has had six or seven calves. She is also a first-rate milker, and has always a large pendent udder.

Symptoms.—Is standing up and looking very anxiously, as if tired and wanting to lie down, and is all of the shuffle with her hind legs, and evidently has been doing so for some time, as there is a great patch in the cowhouse floor with the marks of her feet. Respiration too quick. Ears cold. Pulse too quick, but weak. There appears to be great weakness in her loins, and her hind parts wriggle about. She has just dunged a fair quantity, and also urinated about a quart.

The symptoms evidently denote "puerperal fever."

Treatment.—Gave Liq. Ammon. Acet., ℥vj; Ol. Ricini, ℥xx; Mag. Sulph., ℥xij; Sulphur Sub., ℥ij; Ol. Croton, guttæ v; and applied Lin. Sinap. et Lin. Lyttæ, ā; Sps. Tereb., ℥j. As Symonds recommends the antiphlogistic treatment in the early stage, I thought I would once more bleed, (notwithstanding my failure in numerous cases,) and accordingly I took about four quarts of blood from her whilst standing, and on doing so we had great difficulty in keeping her up, as she appeared a little faintish. Soon after she lay down very comfortably and remained so for upwards of two hours pretty quiet, and with her head up and not to her side.

10 A.M.—She got up very fairly, but when up she was very weak, and tottering in her hinder parts. When up her respiration became quickened. Soon after she lay comfortably down. Gave Tinct. Aconite, guttæ xv; Liq. Ammon. Acet., ℥vj, in some water, which she swallowed well. She also drank about three quarts of chilled water prior to giving the medicine.

11 A.M.—Still down. Pulse 60, but small. Drinks a little water occasionally.

1 P.M.—About the same. She made an attempt to rise, but could not do so.

5 P.M.—Worse. Head totters about much. Gasping as if for breath; and as it was an excessively hot day, I gave her all the air I could, by knocking off the boards. Pulse 68. Ears and horns colder. The spine rubbed every now and then with mustard. Repeat Haust.

7.30 P.M.—Seems better a little. Pulse the same. Bowels not opened. Gave Soda Sulph., ℔ss; Liq. Ammon. Acet., ℥vj; Ol. Croton, guttæ xij, in water, which she had some difficulty in swallowing.

10 P.M.—She has turned over on her other side, and a little milk has been obtained. Pulse 64, stronger and more distinct. Does not seem in very much pain, or struggle as they generally do, and she has been so throughout the day. Sits up in a listless way, and has not her head quite so much to her side as she had. She has been well clothed recently, and her body is warmer, but her ears are not warm. I almost fancy she is quite as well as she was.

12 P.M.—She is in the same place as where we left her, and evidently she has not stirred. Ears deathly cold. Head turned more to her side, and she is in a dull listless way. Scarcely any pulse to

be felt. Drew a little milk from her. Gave Ammon. Carb., ʒij; Tinct. Aconite, guttæ x, in water. She swallowed it fairly. Stimulated spine; clothed her well up, and left her.

14*th May*, 2 A.M.—About the same. No signs of amendment. Ears still very cold. Drew from her two quarts of milk. Moans a little. Is sensible. Gave Sps. Æth. Nit., ʒjss, in some water, which she swallowed pretty well. Head mostly inclined to her side.

4 A.M.—Much about the same. Ears no warmer. Has not altered her position. Moans occasionally.

5 A.M.—Bowels not opened. Ears still cold. Sits up pretty cocket, and does not seem in much pain. Grunts occasionally. I do not think her any worse. Gave Ammon. Carb., ʒij; Tinct. Aconite, guttæ x.

7 A.M.—From last date she has been about the same. Bowels not open. Is warmer, and I think better. Respiration calmer. Pulse stronger, which occasionally intermits. Continues in a sitting posture, and seems more comfortable, and the symptoms are more favourable. She drank some water. Rubbed her spine.

11.30 A.M.—I found her sitting up, and she was warm and comfortable, and apparently going on well. I felt inclined to introduce the catheter for the first time, as in these cases there is frequently retention of the urine; but I found, on trying to do so, that she was too near the wall, when the man in charge of her said, "I daresay she will founder forwards if we hit her;" and on doing so she not only foundered, but she actually got up very fairly. I then tried to introduce the catheter, and in doing so it induced her to urinate, I should think, three quarts, and soon after she dunged a little, which was rather hard.

1 P.M.—Still up, and looks very fair, and does not shuffle about much. Gave some linseed gruel and water gruel occasionally. She has also dunged, which is tolerably soft. Gave Ammon. Carb., ʒij; Tinct. Aconite, guttæ x; Ol. Croton, guttæ xij. I gave her a handful or two of hay, which she ate. Have got several lots of milk from her, and her udder is softer.

12 M.—She lay down, and remained so for two hours.

2 P.M.—She got up again, and remained up for twenty minutes.

4 P.M.—She is now apparently going on well.

16*th*.—From last date to the present she has been going on very well, both in getting up, feeding, &c.; and her bowels have been well opened; and this morning she was taken out of the cowhouse, and walked tolerably well, and from this time she went on very favourably and got all right.

Case 15.

A cow of Mr Bates's, baker, of this town, six years old, three parts bred, in nice condition, but not to say over fat, calved at 9 P.M., June 19, 1864, and had an easy time of it; cleansed three hours after, and afterwards fed well, and stood up until 3 in the afternoon.

Symptoms.—At 5 P.M. I first saw her. Is down, and cannot get

up. On hitting her on the left flank and across her loins she seemed very much affected by it, and which made her quite nervous, and threw her in apparent pain.

She made an attempt to get up when I hit her, but she failed in doing so. She sat up in a natural way, and showed no signs of putting her head to her side. Pulse not much different to health. Udder large and hard. Was warm all over. There seemed a nervous anxiety about her, as if something more was to follow.

Treatment.—Although I did not notice anything, particularly about the pulse, to warrant me in bleeding, yet I thought it prudent to do so, as "loin fallen" is considered an inflammation of the spinal cord and brain. I therefore took five quarts from the left jugular vein.

The blood, I thought, was of a much darker colour than natural, and it issued from her very fluently at first, but the latter half came more slowly. I then gave to her about three parts of the following drink in some gruel :—Mag. Sulph. ℔j ℥xij ; Ol. Croton, ʒss ; Sulphur, ℥vj ; Pulv. Sem. Carui, ℥iss, and rubbed on her spine some Lin. Lyttæ, ā ; Sps. Tereb. et Ol. Croton, ʒij, and had her made comfortable, and her udder to be well rubbed and drawn.

8 P.M.—She has now turned, or rather shuffled down into the "grooping." The symptoms now are completely those of "loin fallen." Gave Lig. Ammon. Acet., ℥viij. All milk to be got out of the udder.

10 P.M.—About the same. We now drew her round into a better position. She is more helpless, and scarcely struggled on putting her round. After putting her round we lifted her up on her side, and bolstered her up, but she seemed to have scarcely any inclination to stir, and her head was barely supported. In the course of the night she had two doses of medicine, each composed of Liq. Ammon. Acet., ℥vj ; Tinct. Aconite, guttæ vj. The last dose was given towards 6 o'clock, and she had great difficulty in swallowing it.

21*st*, 6 A.M.—She is all at full length down on her right side, and has been so for hours. Is quite insensible, as one can move one's finger over the eye without producing any effect, and she does not stir on pricking or hitting her. Her skin is smooth and moist, as if she was gently sweating. Pulse at the breast distinct but quick. She has swollen a little, and nothing has come to her. I told the owner I had scarcely any hopes of her recovery, and that he had better make the best of her ; and he took my advice and sold her for £3. There came from her about a bucketful of blood.

Post-mortem Examination, 9 A.M.—I went down to the slaughter-house and saw her opened. The *uterus* was found hard and well contracted, and altogether sound. The cotyledons were much diminished in size, and there was not a vestige of placenta or any secretion in it.

The whole substance and the interior and exterior surfaces of the uterus were of a nice pale natural colour, and not a tint of inflammation on them.

The inside of the right loin, in the neighbourhood of the kidney, was a little redder than on the other side, and there was some little effusion of lymph at the fundus of the bladder and around it. *The first stomach* was filled with well masticated food, and was healthy. *The second stomach* had little in it, and was sound. *The third stomach* was also filled with well masticated food, which was all quite soft, especially so about the opening into it, and I must say I never saw any stomach look more healthy in its textures or contents. *The fourth stomach* was slightly discoloured on its mucous surface. I laid open the whole tract of the *small intestines*; one half of them—viz., that half extending from the fourth stomach—had the appearance as if they were very much diseased, especially so on their mucous membrane, which was of a dark brownish gray colour, and streaky in places. Some places were slightly ecchymosed. The other half were discoloured and of an unhealthy dark colour, but not so much so as the former half were. The whole of them contained liquid fæces or secretion, and as if the medicine had been operating on them. The whole of the small ones, exteriorly, looked dark-coloured and blackish before they were opened. *The large intestines* were quite healthy, and contained hardish fæces or ingesta. There was a little more hardish ingesta in the small intestines a short distance prior to entering into the large ones.

Worms and Fibrinous Concretions in the Bloodvessels of Horses and Colts. By G. ARMATAGE, V.S. to the Marchioness of Londonderry.

IN the September number of the *Review*, an interesting account of some cases of the above nature are given by Mr J. Seaman, V.S., Saffron, Waldon.

During my residence in Oxfordshire, six years ago, several parallel cases came under my notice, which, in their specific characters, hitherto as I believe undescribed, and unnoticed by veterinary writers, claimed a place among a file of rough notes, which I had intended for future arrangement and comparison; but unfortunately were lost, or otherwise appropriated by some unknown hand to purposes not intended at the time of their collection.

My memory therefore serves only to admit of my recognising in Mr Seaman's report a close analogy to the cases which came under my observation, with this addition, that the worms were found in some instances also in the cavities of the abdomen, under the peritoneum, and even among the intestines in isolated conditions;—anorexia, marasmus, diarrhœa, &c., being prominent features of the cases, all of which were in animals on low-lying lands and rank cold pastures, situate on the Oxford clay in the course of the river Ray towards the Isis; a district frequently under water for a great length of time.

In February last I had the good fortune to meet with another case,

an account of which I lost no time in making more secure than the last; it is as follows:—

Several ponies, barely nine hands high, were received at our hospitals on the evening of the 13th, all of which, in appearance, were healthy, but in very low condition. When placed into a proper shed for their reception, each partook of the hay provided with relish, and after the lapse of twelve hours, with the rest and food, their general appearance was much improved. None, however, would eat corn; at this we did not feel surprised, as that is a practice which most animals purchased of this class have to undergo some tuition in, never having seen or tasted it in their native wilds—the Highlands of Scotland, and Shetland. On the afternoon of the 15th, one—the poorest—was observed to be dull, and to move stiffly when led out to water; but nothing further was noticed, or even this communicated to me; as the whole were suffering from slight colds, it was considered of no moment by the attendant. However, on the morning of the 16th, in making my usual rounds, I noticed a pony absent from the number, and in searching found him lying in the darkest corner of the building—pulseless, paralysed, and comatose. He died in twenty minutes.

Post-mortem Examination, immediate.—The animal was about nine years old. Abdominal viscera devoid of fat. Muscles flabby, and lacking natural moisture. Blood black, thin, and uncoagulable. Intestines pale, and contained much fluid.

Mesenteric artery surrounded by a large mass of partly fibrous and partly ossified matter, the coats being thickened and involved in the deposition; it also contained thread-worms somewhat larger than the filarii bronchii of the calf. Several others were also found in the aorta. In length they were about three-fourths of an inch, small, tapering at the extremities, and perfectly white.

Further minute search revealed no more, at which I was rather disappointed.

The stomach was healthy externally; internally, the mucous membrane exhibited two different colours—a light and dark red, the latter being in irregular patches, exhibiting a mottled appearance; which in reality proved that the ordinary membrane was partially removed, and when touched, or slightly rubbed with the finger, came away altogether. The whole was covered with a very thick coat of glairy mucous,—exactly like the white of egg,—which coagulated and turned white in alcohol.

The liver was enormously enlarged, hardened, and obliterated in most part. So tense and unyielding, as if forcibly distended from the inside, the outer membrane being stretched and glistening.

No bile or fluid of any kind escaped when cut into. The whole gland weighed *eleven pounds*. Lungs healthy. Heart firm and bloodless in its texture, with black patches of ecchymoses on its exterior, especially in the locality of the coronary vessels. Left ventricle contained no blood, nor the stain of it; but the auricle possessed a

small quantity similar to that found in the right auricle and ventricle, and bloodvessels generally—thin, black, and uncoagulable.

Brain congested and serum effused; spinal cord not perceptibly altered.

About four ounces of deep amber-coloured semi-transparent urine was found in the bladder, of Sp. G. 1016. The various tests for albumen were negative. Trommers' test gave the characteristic reddish brown precipitate; and the fermentation test produced copious globules of gas after being set aside some time, occupying about half-an-inch of the test tube $\frac{5}{8}$ths diameter, both indicating the presence of sugar.

Veterinary Records. By G. ARMATAGE, V.S. to the Marchioness of Londonderry.

CHRONIC DISEASE IN A PONY; AND INJURY TO THE RECTUM.

THE subject of the present description was a chestnut pony nine years old, ten hands high, employed in one of the coal mines of Lady Londonderry. On the 30th of January of the present year he was brought to the stable at two o'clock in the afternoon, after having completed his work for the day, without having exhibited any unusual symptoms, and partook of his food as usual on his arrival; the horsekeeper also noticing nothing different to his ordinary habits.

Next morning—Sunday—he was found standing in an oblique direction across his stall, and stretched as far as his legs would admit, without actually touching the floor.

He had urinated, and evacuated the rectum also. When turned to the water-trough he drank a little. His morning meal was not touched, which caused the horsekeeper to feel surprised; but still nothing warranted him to believe that any serious condition was indicated. Being quite a favourite, however, many inquiries were put by "Tommy" to "Peter" in pure pit phraseology; but as his charge was silent, the old man determined to see him again in a few hours.

At twelve at noon the respiration was slightly accelerated. He was walked out, and beyond the disposition to stand unusually stretched across the stall, nothing further was observed, and "Peter" was declared to be "*shammin'*." At 5 P.M., however, he was found dead.

A *post-mortem examination* could not be made before the third day, when the following were the conditions:—

Lungs healthy. On opening the abdomen large quantities of adipose tissue were met with. The stomach greatly distended with gas. Intestines, especially the small ones, presented patches of extravasated blood on the peritoneal surface here and there. A few lumps of masticated chaff and grains of oats were found distantly located throughout the cavity of the abdomen,—an occurrence which favoured the conclu-

sion that rupture must be present. The intestines were carefully traced throughout their entire length, when about a foot or fifteen inches from the anus the rectum was thickened in all its coats, secreting pus on the inner surface; and in a longitudinal direction there existed an opening, opposite to its attachment to the meso-rectum, about an inch long, with well defined edges, and apparently having been done by some sharp instrument.

The peritoneal surface was blanched over the diseased portion of intestine, extending the length of a man's hand. Contents of stomach and intestines pultaceous throughout.

The liver was found to be diseased, one half at least of each lobe granular, easily torn, and structure impervious, performing no functions, being of a deep red colour. The small lobe was soft, flaccid, externally of a dirty green colour, resembling most closely in appearance what is termed black cotton wadding, as seen under the modified influences of reflected light.

The ducts in the small portion which was healthy, were much filled with bile. Spleen and pancreas healthy. Kidneys apparently healthy, and of normal size; but when cut the pelvis contained pus. The left ventricle of the heart contained a closely-fitting clot of lymph. Hitherto the animal had always exhibited the most perfect signs of health; was in capital condition at the time, and looked upon with pride by the driver, who was so fortunate as to have him "*cavilled*," *i.e.*, "*allotted*," for his use, and envy, when the end of the quarter brought with it the usual changes.

As the drivers of these animals in coal mines are very brutal in many instances, it is supposed that some rival, who grudged the boy his fortune in having this pony during the present quarter, had purposely committed the injury, by forcibly thrusting up the anus some sharp instrument, such as a "*drill*,"—a kind of chisel made of round steel, used for boring the coal when blasting with powder.

The most atrocious acts are sometimes committed by these cruel individuals, which are seldom traced to the proper quarter, as "*nobody*" ever sees them, or if they do, resist all attempts to obtain from them evidence to the effect. It is the interest of all to keep silent; and thus many poor unoffending creatures have their eyes literally knocked out with whip-handles, pick-shafts, or anything which happens to be within their grasp. Sometimes a coal-pick itself is used to chastise a horse or pony, the point of which is forced several inches into the flesh. I have known horses and ponies irritated to run away, and kick, to the extreme danger of all who may be on their track—ligatures tied round the penis when drawing—and the tongue also firmly tied to the lower jaw, or otherwise pulled or cut out. The cases of compound and comminuted fractures of the extremities are common from the practice of racing to the stable along a waggon-way beset with rails, sleepers, and pulleys. The latter, being half sunk in the ground between the former, or otherwise lying on their flat sides, according to the position of the

rope which runs over them, present a most effective means for such an accident, particularly when they are in motion, or the encounter takes place in the dark, which is not unfrequently the case.

Not long ago, an accident having occurred during a race, in which the metacarpal-bone was broken in the middle, and hanging only by a piece of skin about half-an-inch broad, the inhuman rider, after stopping to ascertain the cause of such an interruption to his progress, actually mounted again, and compelled the poor creature to carry him to the stable, where he left him, without pointing out to the horsekeeper what had happened.

Introductory Lecture, delivered at the New Veterinary College, Edinburgh, by Mr GAMGEE, Sen.: *On the Economy of the Foot of the Horse; Injuries and Diseased States incident to it; and on the Art of Shoeing.*

GENTLEMEN,—The duty I have to discharge attaching to the sections of veterinary science and art, which have been allotted as my part to expound to you, consists in demonstrating the physical construction and functional characters of the foot of the horse, and in establishing rules for guidance in the art of shoeing, so as to obviate the many evils which commonly follow from irrational application in practice of the resources at our command. It also forms a very essential part of my course to exhibit the morbid conditions to which the feet of horses are subject, describe their causes, preventive measures, and the remedies to be had recourse to for their restoration.

The foregoing, however, affords only a partial view of the objects contemplated in the course before us, since, apart from the consequences to which empirical management of horses' feet give rise, there is enough to arrest the attention of thoughtful men,—well repaying the time and labour necessary for an analytical and systematic study of those regions, in investigating the normal state on which perfection of action in horses depends.

Horses, the subjects of our special solicitude, demand of us knowledge, not as is commonly believed, merely for relieving their pain, though that is one, and an important part, as I shall hereafter notice; but it is neither our first nor greatest object to be achieved; the whole subject requires to be approached with a predetermination to investigate first causes. The art of relieving may be, and commonly is, only the soothing of pangs which previous bad management has brought on; and the most certain way to learn how to avoid the occurrence of disease, and how to cure it, is to become profound in the knowledge of what is health.

We must learn the mechanism of the horse, theoretically and practically, before the derangements commonly present can be, to any useful purpose, appreciated.

Horses, in their normal state—viz., free from disease—represent a current value in the kingdom, varying from five pounds a-head to several hundreds of guineas. What, then, constitutes the difference in the value of the two extreme classes, or degrees in perfection, for which the different sums are obtainable—the highest prices for the best being the most easily obtained, and competition for their purchase is usually the most keen? Who should be the pioneers in establishing knowledge, varying in kind, and capable of, firstly, raising the standard of merit amongst the several classes, and, secondly, of shewing the value, individually and relatively, of all horses, if not the veterinarian? There is, or should be, a centre whence positive knowledge of the kind contemplated should emanate, and where capability for critical analysis should lead to exposition and exclusion of erroneous doctrine, where merely questions of fact are at issue. In some such way must all human institutions exert their influence for common good. If universities, colleges, and schools harbour false systems, not only will the immediate disciples partake of such mental culture as is supplied, but the teaching will thence radiate, and become the means of wide-spread error and disappointment. On the other hand, all that is laudable as tending to the common good, flows from these fostering centres, and this is now happily becoming more and more the case, under the influence of public institutions throughout the civilised world. To such, however, the veterinary art in this country has furnished regretable exception; the errors which were rife in our boyhood, and cherished within the walls of a veterinary college, where they took firm hold on the minds of those most ardent in the pursuit of knowledge, became with time widely disseminated, and now and for many years past have been popularised and adopted by horse owners, and imitated by their dependants.

Anatomy, constituting as it does the chief pillar on which all true art of medicine and surgery is founded, whether applied to man or to the lower animals, is pre-eminently the indispensable guide in all theory and practice having reference to the feet and action of horses, their physical form affording the criterion of the degree of speed and power with which they are endowed. As the relative degrees of perfection in development of form and action, determine the worth of horses, it follows that ample understanding of these matters demands earnest attention, corresponding to the interests involved.

In advising students at this opportune time to entertain a broader view than has been customary, of the proportions of the horse, the proposition before us resolves itself into the ultimate questions of the condition of the foot, of soundness and unsoundness, of great worth and worthlessness; in fact, as to whether a most extensive and important department of the veterinary art is to be usefully and honourably cultivated and practised or not. Now, while first-session students are devoting much time to the acquisition of a knowledge of the skeleton, so necessary as preparatory to all

succeeding steps in anatomical learning, and while the senior workers among you are for several hours daily dissecting in turn the different regions of the horse, it may be of some encouragement to be assured that it is only by such means that you can attain to a knowledge of the foot, in a way to be of avail in your practice hereafter. It may occur to some that in this course we are treating of the foot, and therefore should confine our attention to the distal regions of the limbs exclusively; but without going over the general system brought under notice by your able teachers, from whom you are receiving ample advantage, I beg to state that it is desirable that the general course of instructional investigation should take precedence, and also be carried on simultaneously with that of the sectional division. The animal economy is required to be comprehensively studied, system after system, beginning with the osteological as the framework. From such methods alone can we proceed to treat on phenomena with full advantage; the whole enters into every part in considering design in animal mechanism. I purpose, therefore, in accordance with these views, to submit for your attention the anatomical arrangement of the foot, with my own views on the laws which govern action,—not confining the notice to detached parts, but extending observations to laws, constituting a whole system of action; and in this way of treating the subject, reference will have to be made to parts remote from the foot, and thus it will be found that not repetition, but observations supplementary to your general anatomical course, will characterise our special department relating to the foot.

Shoeing, as far as it is practical to teach so difficult an art by rules, will form the second division of my course, and I have tried hard, over a period of many years, to acquire a mastery over this department, so as to be able to infuse some right notions on the matter; and, so far as success in carrying out the work goes, I have reason to feel satisfied; but it would be wrong to ignore the fact that it is by no means easy to popularise a system, and to train hands as well as minds to work it out, where much discipline is required to ensure proficiency in the art. Still, I have continued working on, encouraged by the reflection that all advances or changes of method exact long and patient labour. Again, I begin to see that my labours are appreciated, and that the system we are adopting is being imitated, and that, too, in some of the great centres of England. I therefore feel assured, that once begun, there will be no stoppage until a general change for the better in the art of horse-shoeing has been made in some degree effectual.

Since, however, I have seen it is impossible to do all that is desired, I have determined to use my powers to do all I can in a good cause; and that which I see is practicable, and from which some good results have been achieved, is to point out the erroneous tendencies of past teaching. Meanwhile, some of our students have become instructed in details sufficient to enable them to carry on the work with excellent effect. Nor have readers of my papers and workmen who have seen our

plan, failed to take up ideas. But that which I cannot do, and which neither you gentlemen, can do, is this—I cannot make proficient pupils by the mere delivery of a few lectures. Knowledge comes by doing. Then again it should be apparent to all that in the short time which is devoted to the routine work necessary for the obtainment of a diploma at the Royal College of Veterinary Surgeons, none can be spared for practically working at horse-shoeing. Progress, therefore, may be slow for a while in the realisation of a proper system of shoeing and its general adoption.

When due consideration is given to the fact, that the art of shoeing is the most effective and general of all known agencies for the conservation of horses, and also the first among remedial appliances for their restoration in almost all cases of lameness, its importance as a branch of the veterinary art can hardly be over estimated.

The abnormal or diseased states of horses' feet will form the subject for consideration in the third division of my course. And since disease implies alteration of natural structures, and correspondingly of functions, reference to these latter, as standards, will frequently be made.

Besides showing some of the reasons why an intimate knowledge of the foot of the horse should be acquired by veterinary students, I think it equally incumbent on me to point out causes which have hindered the advance of systematic cultivation of this branch of veterinary science. There have been the indulgence in too much talk and too little application to the work amongst men in authoritative positions, who have assumed to teach what they never learnt, by using many words, the tendency of which was to explain away established truths, and the confounding the good works of able men in past ages, by the intermixture of the new notions.

It may be asserted that no section of veterinary art calls for so large a combination of scientific culture and manual skill, as that which takes for its sphere the whole locomotive system of the horse, in all possible comprehensiveness—viz., development, conservation, and restoration.

In the department of our art under consideration many labourers are required, necessarily differing in the extent of their attainments, yet all would be gainers by a commonly-prevailing, well-grounded system of knowledge to work upon. When the teaching on a science or an art is sound, the knowledge prevalent amongst its followers will differ little in kind—it will be more in degree by which distinctions will be drawn.

In all relating to horses' feet, how they should be managed, shod, and surgically treated, how different is the case! All has been governed in the matter, during the last seventy years in this kingdom, by opinions and crotchets, each individual adopting his own,—as if facts, phenomena, and systems had no reality, or that these mysteries, bewildering as they have been made to appear, are beyond the pale of such tests and standards as measure men and their works generally.

The working farriers are, as a class of men, the most abused and ill-appreciated of any body of artisans we could name, relative to the kind and amount of trained skill required of them, and taking also into account the value of the subjects committed to their care, and the extent of evil resulting from injury by uninstructed hands.

Knowledge of a true and undeviating kind should be established and made common; and once let the educated veterinarian possess this material, it would soon extend to the less privileged, in the same way as the whole array of workers in the establishment of an able engineer acquire ability and character accordingly.

"They manage these things better in France," where they very early attained to a systematic plan of horse-shoeing; for when they took the lead in founding modern veterinary colleges, they aimed to instruct the then practising farriers—improved the material they found well advanced for the purpose. The founder of those colleges, Mons. Bourgelat, did not despise, but enlisted those men in the cause of veterinary reform. While in England the opposite was done; the farrier was pronounced to be ignorant, obstinate, in fact, unlike other men, he was regarded as not capable of all degrees of improvement, as naturally the whole body are.

At present, the veterinary student and teacher lack encouragement in that part of the college curriculum to which our subject belongs, in so far as scarcely any knowledge of the matter is required by the examining boards; and then comes the question as to what will be found satisfactory there; you have no guarantee that that which I show and demonstrate will have found its way to all the tables, or have been regarded with sufficient favour there to receive consideration.

We are subject to no such common or bye-law as compels men to give up old errors, or to test the merits of new doctrines; these have to find their level by time and force of circumstances. In the truly liberal arts, there is always prevalent a generous catholic spirit, by which the common good and advancement of knowledge is the chief aim, and no sooner has a phenomenon been made out, or some important mistaken view cleared up, than it is hailed with delight, and made known at the proper centres in all countries. These remarks admit of abundant illustration relative to the science of chemistry, anatomy, medicine, and surgery, and the other arts and sciences,—exception in veterinary matters almost alone calls for notice or new action.

In conclusion, I beg to state, that while I think it advisable that you should bring your energies to bear on every part in the curriculum prescribed, during your stay at your college, into practice; I think it would be well to follow the example of the medical profession, and divide the labour.

Our brethren, of the higher sphere in the healing art, carry on their university studies, to a great extent alike, as medical students, during the several years of their career, and towards its close make

choice of one or other of the two great branches of medicine or surgery into which the talented men divide. When again sub-divisions are made, by different practitioners following some special branch, to the almost exclusion of other departments, every inclination to prosecute inquiries, and to concentrate attention on a given subject, can be satisfied, and science and the art of medicine gain thereby. While in our case, with every species of domesticated animal for our patients, it is taken for granted, that every veterinary surgeon, with a part of two separate years devoted to the learning, is to understand the natural characteristics and ailings of the whole range of animals committed to his skill.

It is not long since the horse alone was made the subject of attention at our, then, only veterinary college; at length it was shown that cattle, sheep, and other stock, claimed, in the name of public and private interest, in the interest of the public health, and of humanity, a large share of all available veterinary knowledge, and those views have continued to become more and more recognised.

While, however, these new fields for veterinary science and art are opening, the number of horses in use continues on the increase, and their value is likewise multiplying, and yet there is no stir made to prepare for these emergencies, no increase in the time devoted to acquire the status of veterinary surgeon; and no new special branches are cultivated, or followed in practice, in accordance with the known requirement. All members are, by virtue of their diploma, assumed to be expert, alike in the stable, the shoeing forge, the byre, the fold, the farm steading, and the kennel.

I venture to say, that there is not one young veterinary surgeon in twenty that would not feel ashamed to acknowledge his insufficient acquaintance on any one of the above departments—while it would, I firmly maintain, be infinitely more creditable and laudable, even to state that, "I have not devoted myself to this or that, but have marked out such a range for my labour." Out of such procedure good would follow, by the multiplicity of subjects being better understood and done—the practical part, accordingly, better accomplished. Under these means, mutual friendships would grow up, as one member would consult and recommend his neighbour.

Fibrous Degeneration of the Œsophagean Canal. By WILLIAM HUNTING, Student in the New Veterinary College, Edinburgh.

SIR,—As I believe such cases as the following are by no means common, perhaps it will not be deemed by you unworthy of a place in your valuable periodical:—

On Monday, September 5, I was requested to see a cow in the possession of Mr Wood of Seaham Harbour. On my arrival I found the animal standing in the stall, and presenting nothing unusual to lead one to think her amiss; but on giving her a handful of hay, she

ate it, and immediately began to vomit a nasty greenish fluid. This was accompanied in about five minutes by enormous distension of the rumen. The bowels were costive, but there was no general disturbance.

The history of the case is as follows:—She was bought in April 1864, in calf; was about twelve years old, and not in very good condition, but improved very much after her last calf. She was always a good milker. Previous to her coming into Mr Wood's possession she had belonged to Mrs Wood's brother for five years, and during that time had never had a turnip in her throat, or a probang passed; neither had she with Mr Wood until after I first saw her. She was first noticed wrong on the 3d, two days before I saw her, when she was found in the field enormously swollen.

I diagnosed the case as one of functional derangement of the rumen, and gave an aperient and two or three doses of Sps. Ammon. Arom.

On Wednesday, the 7th, my father saw her, and gave Prussic Acid, Chloroform, and Quinine every four hours. After the fourth dose, the vomiting ceased and never returned.

He diagnosed the case as organic disease of the œsophagus at its entrance into the rumen. She was ordered to be fed on soft food, as bran-mashes, linseed-tea, and steamed hay. With these substances she was never swollen. She also had vegetable tonics, salt in her mashes, and an occasional aperient. Under this treatment she appeared to improve a good deal for a week or two, but was as bad as ever on being allowed dry hay or grass. She was always anxious to eat dry hay if it was given her, but invariably with the same result—viz., swelling of the rumen. From the day I first saw her till November 19th—the day she was killed—she never ruminated. The last week or ten days of her illness she refused the mashes and the steamed hay; of course she wasted a good deal.

P.M.—Being at college when she was killed, I was not at the post-mortem examination; but my father sent me the œsophagus and a small portion of the rumen. He also said that no disease was visible in any other organ. The parts sent me were as follow:—

The œsophagus, quite healthy, and presenting no dilatation. The œsophagean canal and the anterior sac of the rumen were very much thickened.

This swelling presented a tough, tuberculated appearance; was destitute of mucous membrane; and when cut into, revealed numbers of little sacs, containing a kind of inspissated pus.

The whole mass was of a hard, cartilaginous nature, and nearly obliterated the orifice of the œsophagean canal. The specimen being somewhat decomposed on its arrival, I am not able to give anything definite as to the real nature of the disease. If, Sir, you can afford time to add any remarks, I am sure they will have the full attention of your obedient servant,

W. HUNTING.

REMARKS.—The morbid production at the lower end of the gullet appears to involve the whole thickness of the mucous membrane and muscular coat. The exposed surface is very irregular, presenting numerous rounded elevations of various sizes, with here and there an ulcerated depression, in the depth of which are fragments of disintegrated tissue and pus. The mass of the tumour is firm and resistant, and appears to be almost exclusively made up of fibrous tissue. The small cavities scattered through the substance of the mass at irregular intervals, are filled with a whitish semi-solid material, having all the characters of altered pus. On the cut surface there is no appearance of cancer juice, and microscopic examination does not enable us to detect any of those cells usually considered characteristic of cancer. An examination of the gastric lymphatic glands would have been of interest, but as the morbid deposit did not seem to extend in the walls of the viscus beyond where it was freely exposed on the surface, and as there was no sign of a corresponding morbid production in other parts of the body, it may be assumed that the product was not of a malignant nature.

On the Presence of a Peculiar Modification of Albumen (Metalbumen?) in the Urine of Horses. By ARTHUR GAMGEE, M.D., Assistant to the Professor of Medical Jurisprudence in the University of Edinburgh, Lecturer on Chemistry in the New Veterinary College.

So little has been written concerning the composition of the urine of the horse in health and disease, that I venture to place the following observations on record, as not altogether uninteresting:—

Some weeks ago, I received from my brother a few ounces of the urine of a horse, which had been sent for analysis by Mr Parker of Birmingham. The urine presented a remarkable appearance, for its consistency was that of glue; and when poured from one vessel into another it nearly passed *en masse*. It emitted a slightly fragrant, not unpleasant odour; its reaction was decidedly acid.

When the urine was treated with nitric acid or acetic acid, the gluey character almost entirely disappeared; in boiling it became perfectly fluid, nor was there any appearance of precipitation.

On heating the urine for some time, coagulation took place, when the temperature rose to 173° Fah. The precipitate was entirely soluble in nitric and acetic acids.

Tincture of galls added to the urine produced an abundant, flocculent precipitate.

Alcohol produced a precipitate, which was soluble on the addition of a large quantity of cold water.

Corrosive sublimate produced an abundant white precipitate.

Solution of subnitrate of mercury heated with the urine produced a precipitate of a beautiful red colour, (Millon's test.)

Acetate of lead produced an abundant white precipitate.

Ferrocyanide of potassium added to the urine produced no precipitate. When acetic acid was also added, no precipitate occurred. On heating the fluid it was abundantly precipitated.

Sulphate of magnesia did not produce a precipitate.

Chlorine water caused the formation of a white precipitate.

The above reactions proved very conclusively that the urine contained a peculiar modification of a protein body, differing very essentially in its chemical reactions from ordinary albumen. Several physicians have placed on record cases where the albumen in urine presented certain abnormal reactions. It has been noticed, for example, by Prout and Bence Jones, that in certain cases albuminous urine is precipitated by heat, but not by cold nitric acid; and some writers have stated that the converse has also been noticed. As far as I am aware, no case has been recorded where a substance having exactly the reactions which belonged to the one I have described was discovered in the urine. In its characters it agrees essentially, if not completely, with a substance which Scherer once discovered in the fluid of ascites, and to which he gave the name of Metalbumen. The characteristics of this substance are the non-precipitation of its solution when modified by acetic acid, by ferrocyanide of potassium, and the solubility of the precipitate caused by alcohol in water. The substance discovered by Scherer possessed the other properties of albumen, with some slight modifications. Boiling produced a precipitate, as did also the addition of tincture of galls, corrosive sublimate, and chromic acid. The fluid in which Scherer discovered this substance was of a *slimy consistence.*

The interest attaching to the facts which I have stated above is considerably enhanced by the fact that, in the short time that has intervened since the period when I made the above observations, I have had the opportunity of examining the urine of an aged mare which had for a short time been suffering from slight œdema of the legs. The urine on one occasion presented the same slimy appearance as it did in the case I have recorded above. It was found to contain an albuminoid substance, possessing essentially the same characters, being precipitable by heat, alcohol, &c., but not by nitric or acetic acids.

Apart from the great chemical interest which the facts I have stated possess, it is not improbable that they may prove of more practical importance to the veterinarian. The tests for albumen which the physician is usually satisfied with, are the action of heat and nitric acid; combined, these two tests enable him to detect albumen with certainty in the immense majority of instances, although either taken alone abound in fallacies. The application of heat, for example, to urine of feeble acidity, or of alkaline reaction, will often induce a precipitation of the earthy phosphates, which are

very readily soluble in nitric acid; whilst, on the other hand, nitric acid frequently throws down an abundant precipitate of urates, which are readily dissolved when the fluid is heated. In examining the urine of man, we may lay down as a rule that if the fluid is not coagulable by heat and nitric acid combined, no albumen is present. If *metalbumen* shall be proved to be a common occurrence in the urine of horses suffering from renal affections, the veterinary surgeon will have to be careful in ascertaining its presence, for although differing from albumen in chemical details, its pathological and semeiological value must be the same.

That the albumen which occurs in the urine of horses in a state of disease differs very materially from normal albumen, is rendered almost certain by the statements of Mr Percival on this subject. This author alludes to several cases of albumenuria in the horse, which had come under his notice, and in describing the characters of the urine, says,—"Should it prove albumenous, it will assume a deep or dead straw colour, and *be found of the consistence of a thick solution of gum.*" In all such cases it is obvious the substance occurring in the urine must have been very different from normal albumen, such as occurs in the urine of Bright's disease; most probably it was identical with the protein body which I have in this short memoir described; and it is likely that future researches may prove *metalbumen* to be the form in which protein bodies occur when passing into the urine of the horse.

The Veterinary Review and Stockowners' Journal.

MODIFICATIONS IN THE PRELIMINARY TESTS FOR THE ADMISSION OF CANDIDATES TO THE IMPERIAL VETERINARY COLLEGES OF FRANCE.

THE *Journal des Vètèrinaires du Midi* informs us of certain modifications in the programme to be observed in future by the students entering the French veterinary colleges.

The particular changes made, consist in testing more extensively the candidates' knowledge of Geography and History; while the trial, hitherto enforced, of forging a horse-shoe, is abolished.

It is the last-named test on which we would offer a few observations, because it has reference to a most important branch of veterinary art,—a branch, too, in which the French excel, having succeeded in founding the best system of shoeing yet established in any country.

We fully concur in the wisdom of relinquishing a test, the enforcement of which tended more to indispose youths than to encourage them, to take up the art of shoeing as a special favourite subject, which many of them would more effectually do voluntarily.

It is some twenty or more years, since we discussed these questions with some of the old and most eminent of Continental veterinary professors, all of whom concurred in assigning the first place in importance to the art of shoeing,—the only question to determine being, how to raise it to the highest possible standing of effectiveness.

Monsieur Bouley, the elder, who was the companion of the first Baron Larrey, during the Northern campaigns of the first Emperor Napoleon, and the late Professor Carlo Lessona, formerly director of the veterinary school at Turin, both justly renowned men, and in the zenith of their labours at the beginning of the present century, have testified to us, how efficiently the art of shoeing was cultivated at the veterinary schools of Alfort and Lyons, and both of them alike affirmed,

to what living and younger professors in the art, on the Continent, are agreed on, that there are not so many students who, on entering the schools in later years, are equally expert at horse-shoeing compared with those of early times; and the reason is plainly discernible, and holds good in all countries.

When veterinary schools were first established, the most able amongst the men already initiated in the art sought to be admitted into the reformed and improving institutions, and thither as candidates brought their already acquired manual skill.

Now, however, the veterinary schools are all, mainly, supplied with students who, having obtained their ordinary education, go there to commence their professional course; therefore while it was wise to test the men of former days as to their relative skill in the art of horse-shoeing, it would be unwise to continue the same test, taking into account the different conditions of the candidates of the different epochs.

It is by no means a well defined proposition as to what limit or kind of knowledge ought to disqualify a candidate for admission into a veterinary college,—so much depends on young men, and such the variety in veterinary matters, in the several departments

In these days, when average school education is almost universal, it seems less than formerly necessary to adopt stringent restrictions on entry; far better, in our opinion, are periodical examinations during college residence, and the insisting on longer courses, with regular attendance. Time forms an essential element in the acquisition and consolidation of all real knowledge.

PERISCOPE.

SOME OF THE CAUSES THAT TEND TO RENDER FARMING UNPROFITABLE.

By Alderman Mechi.

The December meeting of the Club for discussion took place on Monday evening, December 5, in the large room of the Society of Arts, which was kindly lent by the Council for the occasion. The chair was taken by Mr T. Congreve, of Peter Hall, Coventry; and about one hundred members and others were present. The subject appointed for discussion, as introduced by Alderman Mechi, was "Some of the causes that tend to render farming unprofitable." After a few remarks from the Chairman,

Mr Mechi said—In accordance with the notice on our paper of business, I purpose this evening to point out and investigate some of the causes that tend to render farming unprofitable. I shall classify them under the heads of uncontrollable and controllable, apportioning the latter between landlords and tenants, according to their responsibilities. In the tenants' department I shall consider the causes as affecting animal and vegetable management; also soil, climate, and manures. I need hardly say that it will be impossible to deal with so large a subject comprehensively within the time limited, but I will do my best to be brief and, if possible, clear. If the farmers of Great Britain generally knew as well how to produce a profitable result as most of the gentlemen I now see before me, I should have no occasion to read this paper; but, as I have said before, this Club represents the sunny side of agriculture, and that is but a small area compared with the shady recesses of mismanagement, misfortune, and loss. "Plenty of meat and manure" must be, for the future, the motto of successful agriculture. The want of this is a prominent cause of unsuccess in farming. Farmers must learn to sell their crops to their animals, rather than to the miller: even with an immediate loss of 15 per cent., there is a greater gain in so doing. If sending away the crops from the farm impoverishes it, keeping them at home must produce an opposite result; and, therefore, if I want to know how a man is getting on, I ask him how many score pounds of meat per acre he makes over the whole area of his farm. 200 lbs. per acre is a useful quantity. Apologising for this digression, I will now proceed to consider "some of the causes that tend to render farming unprofitable." Here is a long list of them: Not understanding the business of farming, especially the proper management of live stock; farming with insufficient capital, or taking too much land; extravagance in personal expenditure; not attending to your business; hiring your land without a lease; not stipulating for the power of selling or transferring that lease; hiring your land too dear; not suiting your crops to the soil and climate; buying too dear; selling too cheap; robbing, and thus starving, your grass land; too many weeds, and too little hoeing; too shallow cultivation; too little manure; too little live stock; too little purchased food; too little purchased manures; too little good grass land; the absence of steam-power; fat horses and lazy ploughmen; the use of old-fashioned and improper implements; too many trees and fences; too small fields; bad roads and ill-placed homesteads; insufficient shelter for live stock, especially on heavy land; want of drainage on twenty millions of acres, according to Mr Bailey Denton, one of our best authorities; being bound for an unsuccessful friend; too little experiment, and too much prejudice; not insuring against fire and hail-storms; family calamities; personal affliction; the seasons; murrain and blight; wind storm; incendiarism; inundation; local self-sufficiency, and want of general information and agricultural literature; difficulties in the transfer of land; want of agricultural statistics; a minimum crop causing a maximum per-centage of expense; too much seed; absence of piece-work; non-application of chalk or lime to poor, ferruginous, stiff clays; not having a good agricultural library; selling your produce on credit to unsafe persons; wire-worm; late sowing; being generally behind with your work; waste of manure; having a dishonest bailiff; having unskilled or incompetent labourers; neglecting the use of salt for animals and on the land; satisfaction with farming as it is; adulterated manures; adulterated oil-cakes; the want of selection and great care as to sowing the very best seed; the neglect of good parentage in live stock; breeding in-and-in with either live stock or poultry; being behindhand in tillage, sowing, and

the general work of the farm; the state of our laws as regarding the transfer of land; the want of associated capital for the purposes of agricultural improvement; the want of a desire on the part of landowners to seek the aid of associated capital; the want of improved arterial drainage; the want of water supply for summer irrigation. In this list are many unavoidable causes, such as blight, murrain, and adverse seasons. We have an illustration of the latter this year, when tens of thousands of acres, on which nearly £10 per acre have been expended in preparation for a root crop, have partially or totally failed, owing to the protracted drought, thus depriving the farmer of that money return in meat on which he reasonably calculated, throwing him almost entirely upon his corn crop, which can only be disposed of at a very low price. Then, again, a cold, wet season like 1861, deprived many a farmer of his year's profit, and in many cases trenched upon his capital. The furious gale that swept through parts of Scotland early in September, just at the period of harvesting, thrashed out the corn and caused an immense amount of damage. Against these the farmer cannot insure, although he can against hail-storms. The recent Marsh-land inundations ruined several farmers. To all these must often be added personal and family afflictions of various kinds. Our Royal Agricultural Benevolent Institution has brought to light already too many of the causes to which I have alluded; for, on perusing the 150 appeals for our support, losses by stock, bad seasons, and family affliction figure prominently, to which are not unfrequently added loss of tenure without valuation or allowance for capital sunk in improvements. Slowness of return is also a natural cause of moderate profit. We sow our wheat, and wait eleven to eighteen months for its conversion into money; while a dealer in stock with a good connexion will make his return and realise his profit daily or weekly, accumulating frequently money enough to purchase and occupy large farms. A dealer can thus readily obtain advances from his banker, or assistance from a friend, because the article in which he deals is tangible and readily transferable; while the trammelled farmer, who has necessarily invested capital in the improvement of the soil, cannot deposit his lease as security, for he has not (as we have in towns) the power to transfer or dispose of it; and in case of premature death or failure, his family may be deprived of the value of his investment in improvements. This is an anomalous and unbusiness-like state of things, and tends to diminish the value of land, and discourages the introduction of wealthy and independent tenants. I should like to know what would become of business in towns, if we could not dispose of our leases when it suited us to do so. I have written a long paper in my book on this subject. In considering the shortcomings of landlords, I deal with the question nationally, and not individually. Landlords are like other men—naturally and properly anxious to preserve their own rights and privileges. Many of them, noble by birth and vast in estate, have taken an advanced view of the proper condition of British agriculture. They have emerged from, and cast of, old-fashioned feudal restrictions and restraints, and have ceased to look upon farmers either as churls or vassals, and have attracted, encouraged, and I may say created, on their estates men of high intelligence and considerable capital. They have granted leases, valuations, &c., in a business manner. The tumble-down and insufficient sheds and hovels of antiquated farming have been swept away, and replaced by substantial buildings adapted to a large increase of stock, machinery, &c.; and such a class of tenants have been properly thought worthy of residential improvement. The labourer has no longer been looked upon as an incumbrance to be foisted on an adjoining parish; but a sufficiency of well-constructed cottages, with pure water, and the necessary area of garden, give evidence of a humanity and an intelligence highly conducive to diminished poor-rates and increased morality and efficiency. But has this emergence from feudal trammels abstracted aught from the dignity, the influence, the respect, or the esteem felt for these worthy landlords? Certainly not, but the reverse. Such men prefer intelligent respect to clownish or ignorant servility. It is gratifying to find noble dukes and great landlords treating agriculture as a business, and not ashamed to avail themselves of associated capital to improve their estates and increase their rentals. I know some of them who prefer letting the shooting to their tenants, at 6d. or more per acre, rather than to strangers. Such a system does away with the heartburnings of game-preserving, and in some cases attract a superior class of tenants. But, unfortunately, the picture I have drawn does not apply generally, and there is abundant need of a more liberal and commercial system in letting land.

Farming Profits.—I have reason to believe that each farmer looks at my remarks

from his own point of view, according to the circumstances in which he is individually placed. For instance, those who hold deep, rich fertile soils, having attached to them an extensive area of fine old grass land or meadow, will consider my estimate of profit too low; while the struggling occupier of cold, hungry, ferruginous, undrained clays, or other poor soils, who is losing his capital, or merely obtaining a scant and penurious livelihood, may think my estimate of profit much too high. High farmers who are doing their duty to themselves and to their country are apt to fancy that I am censuring them, which, of course, is not the case. In forming my opinion of British agriculture as a whole, I pass in review the entire territory of the United Kingdom, and, while doing so, am bound to accept the unpleasant truth that there is an enormous scope and necessity for agricultural progress and amendment. That amendment ought to commence with the owner of the land, whose duty and interest it is to foster progress and afford opportunities for a better state of things. Very vague notions prevail among outsiders generally on the question of farming profit; I will therefore touch tenderly on this delicate but essential subject. Farming is known to be proverbially a slow way of making money, although a healthy, pleasant, and independent occupation—permanent in its character, and not affected by fashionable changes, for appetite is ever recurring, and must be provided for; therefore, so long as there is a population to be fed, so long must the land be cultivated—farmed. As many persons not conversant with agriculture take far too sanguine a view of agricultural profits, I will endeavour to set the matter as clearly as I can before them. When I had the honour to read before your Club a paper on "The Capital of Agriculture: its Application and Remuneration," I stated that, taking the 56,000,000 of available acres of good, bad, and middling land in the United Kingdom,—including, of course, its grass land, which occupies one-half the area of the United Kingdom,—I estimated the capital employed at £4 per acre, landlords' measure, and the annual profit on that capital at 10 per cent., besides a house and offices rent-free, which may be taken as an additional 1¼ per cent., so that the profit may be roughly calculated at 8s. per acre, and house rent-free. This would give for the United Kingdom a tenant's profit of about £25,000,000 annually. On well cultivated arable farms employing £10 per acre capital, £1 per acre profit would be certainly a good average; and I know many very good farmers who consider £500 a year on a 500-acre farm a full remuneration, having their residence, stabling, &c., rent-free, and some trifling advantages of the farmyard. Unlike townspeople, they get their bread, pork, poultry, milk, and eggs first hand, unadulterated, and unburthened with intermediate expenses and profits; also their hay, corn, and straw for their riding horses. Vegetables are also fresh and untaxed; servants' wages are always much lower than in towns; so that altogether their 10 per cent. is equal to a much larger profit in towns, where rent and other matters form a large charge. Where much money is realised in agriculture, it often begins in rigid economy, combined with very superior ability in hiring, buying, selling, and dealing, by great vigilance in the economy and superintendence of manual and horse labour, and a thorough knowledge of stock management. We have many notable instances of great wealth and position attained by those who once followed their own plough, sowed their own seed, fed their own stock, and so got "the fore horse by the head." In fact, sound, practical agriculture is composed, like our good old city of London, of self-made men, who began at the lowest step of the ladder, and reached competence and independence by their own good qualities. So strong is the belief in the truth of this theory, that a respected practical friend of mine in Cambridgeshire said to me, "I never knew a young man succeed as a farmer who began with £10,000 capital." And on asking him why, "Well," he said, "his habits are usually too expensive for a beginner; he trusts too much to others, and is not sufficiently impressed with the necessity for personal supervision, vigilance, frugality, and general economy in the management of his farm." Gentlemen farmers who employ a manager, who himself ranks as a farmer, naturally find a difficulty in obtaining a profit beyond their rent. Extensive practical farmers, who must have assistance, frequently employ working bailiffs, or overlookers, receiving only a moderate increase on the wages of a labourer. Farming profits depend so much upon odds and ends,—I mean on the successful working of every part,—that each should be well done to make a full and satisfactory result.

Mismanagement of Live Stock.—If a farmer is wrong in the management of his live stock, he must bid adieu to all hope of profit. With the very best management he is liable to serious losses, from causes beyond his control. This morning I

received an application on behalf of a most respectable and esteemed farmer, for my presentation to Christ's Hospital, for his son, owing to his having lost £2000 by his live stock. I attach so much importance to this subject, that I consider it should hold a first place in agricultural study and instruction. There are certain great general preventive principles that might be profitably acted upon, although they are now too often neglected; and in very difficult cases, the veterinary should give his scientific and professional aid. But are our ordinary "horse doctors" creditable to British agriculture? In too many cases there is much room for improvement. Our Veterinary College has indeed been a great boon to agriculture, which owes a heavy debt of gratitude to Professor Simonds and other scientific veterinarians. I have written so much in my book upon this subject, and there is so little time here to treat upon the question, that I will dismiss it by saying that Alderman Mechi's once-poohpoohed notion, about the chaffing and preparation of food, are now becoming fashionable among practical agriculturists, who, I hope, will no longer compel their bullocks to drink, in the shape of 150 lbs. of frozen turnips, 13½ gallons of frozen water, with only 15 lbs. of dry, but frozen matter. Let us afford to animals the very same opportunities for comfort that we, as human beings, find most agreeable and profitable, both in food and shelter. I have generally been very successful in avoiding losses by stock; but this year I lost some calves, merely by allowing them to eat their fill of rich sewaged Italian rye-grass. Where they received only a moderate quantity of the same food, they did well. Possibly, if they had received salt on the field, they would not have suffered. Being convinced, by practical experienee as well as by theory, that no farmer distant from a town can succeed well without plenty of live stock, that is, without producing plenty of meat and manure, I attach the utmost importance to the proper knowledge of stock management, either by yourself or your stockman, or by both. I look upon this as a vital question as regards profit. As a proof of this, look at the causes of distress assigned by the 150 decayed farmers who are now candidates for relief from our Agricultural Benevolent Institution. In almost every case "losses by stock" are assigned as a prominent cause of failure. Within my own knowledge and neighbourhood I might quote numerous cases. Mr —— lost all his farm horses by eating wheat from the barn floor, the doors having been imperfectly closed. Other live stock suffer from the same cause. This dry season no end of sheep have died from "shacking," or eating dry barley on the stubbles. There was not enough green succulent food to mix with it, and they were allowed to fill their stomachs with the bare barley, which swelled when moistened by drinking. Farmer so-and-so lost several cows by turning them out to feed when the hoarfrost was on the leaves—icing their insides, in fact. Want of water has caused much loss by fever, &c. Whole fields of wet and frozen turnips fail to increase the weight of sheep, but on the contrary, cause immense losses by death, especially among ewes and lambs. Some very fine cut straw, with a proportion of corn and cake, would prevent all this. So would shelter. When a bullock has consumed 150 lbs. of cold turnips in a day, you have obliged him to take into his stomach 13½ gallons of water, with only 15 lb. of dry food.

Farm Horses.—In the feeding of horses, and cattle too, I have often seen very great waste. I have said jocularly that ploughmen are more fond of their horses than their wives. They love to see them fat, and as they have not to pay for their food, they will, if you do not control them, give it in superabundant wastefulness. How frequently the haystack is at the entire mercy of the horsemen! The dainty, over-fed horses pick out the choicest morsels, and tread the rest into manure. In my case, the hay is all cut into chaff, mixed with some straw chaff, the oats and beans ground into meal, and the meal mixed with the cut chaff in the manger, the chaff being slightly sprinkled with water, to cause the meal to adhere to it, and to prevent the horses throwing out the chaff to get at the meal. When it is considered that in ordinary farming one-fourth, or at all events one-fifth, of the whole farm (landlords' measure) is required to feed the farm horses, in the ordinary way of turning them out, the question of diminishing this great charge is a most important one. If the loss of farm horses by mismanagement could be statistically ascertained, it would form a sum of astounding magnitude, and show a great deduction from the farmer's profits. Take, what is too often a common practice, as an example of mismanagement: Horses, in a state of perspiration after hard work, are ridden into a cold horsepond, or allowed to drink heartily of cold water before they begin to feed; results—farcy, gripes, inflammation, &c. The London brewers' horses drink when they please; but then a steam tube passes through the tank, and the water is always

warm. We know what is the probable effect upon ourselves of drinking cold water when our bodies are overheated. Fat horses are, like fat men, unable to do a hard day's work. Plenty of muscle and condition, with good exercise and wind, pay better. It is observable that a farmer's nag horse is rarely turned out, and yet he looks glossy and well-conditioned. Why this difference of treatment? Again, a farmer seldom goes to market on four wheels. Why does he use waggons? I pronounce them, from unmistakable evidence, to be a cause of loss to him. If he will have the waggon, let it be on *two* wheels. If your stockman does not understand his business, your profit is endangered. If a man is deficient in quickness of observation and comparison, he will not do for stock. You cannot give them to one who does not naturally possess them.

Ventilation.—Farmer —— always had illness among his horses when stalled. Now he turns them out into the yard, they are healthy. The cause is obvious: the stable had no ventilation, consequently the putrescent atmosphere produced farcy and other diseases, much as it does with human beings huddled together in small close rooms. A few 9 or 12-inch pipes inserted through the brickwork near the ceiling, where there is a floor over it, or an opening in the ridge, and at the ends of the roof, will cause ventilation and circulation. The best test of a well-ventilated room or stable, is to get in half-a-dozen cigar smokers for an hour. If the ventilation is good, the smell will soon have passed away. If deficient in ventilation, the scent will long remain. I have a room with a door at each end; after a smoking party no trace of our doings is perceptible the next morning, provided *both* doors are left open at night. If one only is left open, there is not proper ventilation, and the room is impure. Therefore, have several opening under the wallplate, near the ceiling or the roof, both in your cattle-sheds and horse stables, and a couple of doors. In my cattle-sheds I have many openings under the wallplate, and on the ridge, as ventilators. It is important that the hanging or dividing board should reach some distance below the side openings in the roof ventilator. In very cold weather, or during strong cold winds, some of the openings can be closed by straw-bands, so as to regulate the temperature according te season. We all know that cold air contains so much more oxygen than hot air in a given space. I have known several unwholesome cottages and sleeping rooms made healthy by the insertion near the ceiling of some small 2-inch draining pipes. We all know how offensive even spacious bedrooms smell if we enter them after enjoying the pure morning air.

The non-use of Salt for Live Stock.—I hear of so many cases where, by the use of salt, disease and non-success in stock have been remedied, that I consider its absence as very prejudicial. I have always had rock-salt in the mangers; common salt will do as well. Large losses in sheep often occur when being fed on rape or coleworts, especially after frost. This may be prevented by sowing over the leaves, in early morning, about two or three quarts of common salt, according to the size of the fold. I learned this from a large flockmaster who had profited by this practice. Salt appears to prevent swelling or flatulence.

Wire-worm.—Nothing is more easy than to get rid of these pests, either by salting the land, or by the use of about 5 cwt. of rapecake per acre; a little of both is good. I commend this especially to our light-land friends. I have always been a great user of salt, even on heavy land when drained, and especially on grass lands. From 2 to 6 cwt. per acre, according to lightness of soil, is a sufficient quantity. I have found salt and quicklime mixed together very beneficial, especially for potatoes. I always mix guano with about half its weight of salt. This answers well for cereal crops, especially wheat.

Fit Labourers well Supervised.—The reverse of this causes much loss. The labour on an arable highly-manured farm, with a large quantity of stock and steam machinery, is probably, including bailiff and engineer, 45s. per acre. Mismanagement or neglect in this matter to the extent of 20 per cent. would cause a loss of 9s. per acre, or nearly half the farmer's profit. I prefer piece-work where possible. The want of honest or active men on a farm is a sure source of loss. The want of forethought, method, and order adds to this loss; so does the dishonesty of either bailiff or labourers. I have known instances of collusion between bailiff and dealers in regard to the purchase and sale of live stock. Honesty is no doubt the rule—roguery the exception; but the watchful eye of the master is always desirable.

Farmers do not trust enough to Science.—Witness the disbelief in the value of rape and cotton-cake for feeding. And again, they do not often enough refer to their chemists for opinion as to the quality of the cattle food, cake, and manures that they

purchase. The question of a few shillings, or a guinea paid to Messrs Way or Voelcker for their opinion, is trivial as compared with the advantage gained. Farmers are grossly imposed upon, and victimised in many ways.

Soil and Climate.—Probably there is no cause more prolific of failure than attempts to violate the laws of nature. We should always be governed more or less by the nature of the soil and climate. Any farmer changing his occupation and his district must leave behind him local customs, and study attentively the practice of the new neighbourhood. How well this is illustrated by the statistical returns from Ireland, where its moist atmosphere and friable soil are availed of to produce potatoes and oats, and root and green crops, in the proportion of 4 and 8 to 1 as compared with wheat, which only figures for 277,000 acres out of nearly six millions of acres of arable land! A Scotch or Welsh farmer from among the hills must give up all hopes of growing turnips in the stiff clays and cereal climate of Essex, where he must depend upon mangel wurzel, which luxuriates in stiff soil near the sea and hot sunshine, and will produce nearly twice as much weight, and better quality, at no greater cost. Light-land farmers coming to the stiff clays must give up winter folding, and resign themselves to covered yards, and mangel brought home, also to beans and tares. Nature indicates the right crops by her natural productions; where the wild carrot and the wild oat thrives, we know what we should grow. The wild mangel on the sea shore tells us that salt is essential in the growth of that root. The quality of grasses grown on limestone and chalk teaches us that it is in vain to hope for such a production upon our poor stiff uncalcareous ferruginous clays, unless we chalk or lime them artificially. A piece of ground on my lawn grows wild camomile superabundantly; and I have heard of a great pear-grower who always looked out for soil that naturally produced superior pears. We may change the nature of the soil and the character of its products by amalgamation. It is well known about here that on our heath soils 50 tons an acre of chalky clay from the valley will eradicate the former class of weeds, and do more good than manure.

Damage by Game.—The influence of game upon the farmer's profit is a matter deserving our consideration. I presume that we are all agreed that it is highly desirable that our great and dignified landowners should have every proper inducement and encouragement as residential notabilities. We all feel proud of our landed aristocracy, and know their residential value. I am myself an old and ardent sportsman, and therefore can appreciate the zest such an amusement affords to those who love it. Pheasants and partridges I look upon as real farmers' friends, assuming, of course, that sufficient food is provided for them by the landowner. I speak practically on this matter, for 300 fowls have at all seasons, not excepting harvest time, the free range of my corn fields. The harm they do is trivial, compared with the benefit they confer as destroyers of grub and insect. The question of ground game presents a different aspect: hares and rabbits, however well fed, have a strong affection for the first shoot that comes from the germinating seed of wheat in October or November. A hundred rabbits will clear off acres of these shoots in a single night: the consequence is, a deficient and blighted crop at harvest time. Hares take a wider range, and do less injury. I am convinced that the destruction of that first stem is most injurious to the crop; in fact, it cripples irrecoverably the parent stem of the future family. The damage to spring-sown corn is very much less, because at that period of the year there is a great variety of young sweet grasses. Heavily-stocked covers should always be surrounded by grass land; because if highly farmed, which it ought to be, the loss is comparatively small, and may be made good by extra manuring. This cannot be done with wheat, which should never be sown adjoining a cover. We all know that game farms are let below the ordinary rent for land. One thing is quite certain, as affecting the profit—that the land immediately surrounding game covers should be manured much more heavily than any other part of the farm, especially if grain land. So much extra produce limits the area of damage.

The Sewage Question.—Probably there is no more extensive or insidious cause of loss to agriculture than the waste and non-utilisation of our excreta. In the paper I read to you on this subject I estimated that to feed London alone, the produce raised on six millions of acres was annually required, so that the produce of the whole area of the kingdom (sixty millions of acres) may be said to pass through the London sewers into the Thames in ten years. The agricultural mind can scarcely realise such a gigantic and suicidal throwing away of valuable property. Our metropolitan sanitarians must give up all hope of a pure stream while this goes on at Barking

Creek. Already every inlet in the neighbourhood gives unmistakable evidence, by its black and fœtid banks of mud, of its proximity to the great sewer. Owing to the recent Parliamentary Committee evidence the sewage question may be said to be now fairly solved, and reduced to the simple question of a pump to raise it, and a pipe to convey it to the farmer. Those who, like myself, remember the time when there was no gas and a very indifferent water supply, and now see that in almost every house and room in the metropolis a supply of light is obtained by turning on a tap, can easily foresee the time when each farmer will turn on the tap and supply himself with town sewage through his meter according to his requirements. Sewage, like gas, will pass from the impossible to the actual and practical result. Who is to do it is not yet determined. Baron Liebig has shown that all that is wanted to make the sewage perfect is a certain quantity of superphosphate of lime to replace the bones of the animals, fish, poultry, and game, the flesh of which we consume, but the bones do not go into the sewers. If the farmer's produce were returned to him after consumption, we should hear fewer complaints of costly manures and want of profit. Steam-power has rendered this practicable, for it was clearly proved before the recent House of Commons Committee on Sewage that 1000 tons of sewage might be pumped to an elevation of 300 feet at a cost of only 13s. to 14s. I am pleased to see that the question of town sewage is now occupying the columns of our principal newspapers. Twenty-odd years ago, when I first pressed it upon public attention, I was snubbed as a "nasty fellow," and it required all my moral convictions to support me: but I am rewarded now by the prospect of a great public good.

More Meat, more Manure.—The great want in farming is more meat, more manure, and more artificial manures. I have been making up my books to the 31st October, my usual period, and find that after paying for £660 of purchased food, (£300 of which, as grain, was bought of myself at market prices,) my live stock have left me £7 per acre for root and green crops. It would have been £9 per acre but for the loss of £70 by calves, which died owing to being allowed to help themselves to some rich luxuriant Italian rye-grass. The quantity of meat actually made on the whole farm, 170 acres landlords' measure, was 200 lbs. for each acre. I am convinced that the system of shelter and preparation of food, combined with a few acres of sewaged Italian rye-grass, is the key to true economy and profit.

Bad Cotton-Cake causes much loss in stock. The husk of cotton seed is black, and as hard and indigestible as the bark of a tree. Seed-crushers have found out that by keeping a considerable portion of this bark ground up with the kernal, a greater quantity of oil can be expressed; whereas when the seed is decorticated, the outside skin or husk being screened from it, it coagulates or consolidates so much, that they cannot obtain so much oil. Therefore avoid buying dark or black hard cotton cake; good green rapecake is much to be preferred at the same price. Cotton cake when good is brittle, friable, and of a bright yellow colour. The quality of this hard husk is easily ascertained by chewing a small piece of the cake.

Little Fields and Large Fences.—I met at Newmarket, the other day, a good practical farmer, who said, "Mr Mechi, I have only one fence on my farm, of 700 acres, and that is an outside one. Owing to what you have said and written, my landlord altered his mind, and gave me permission to get rid of my internal and unprofitable enclosures." How can a Devonshire farmer, with his 3 and 4-acre fields, compete with my 700-acre friend? and look at the landlord's responsibilities in gates and posts!

Artificial Manures.—Starving or half-starving the land is one of the most certain and serious causes of unprofitable farming. Although I make so much meat and manure, and consume so much purchased food, still I find it profitable to have recourse to artificial manures, especially the best Peruvian guano and superphosphate of lime, and some salt. I have tested this again this very season, and find that although my mangel land was so heavily-dressed with rich shed cake and corn manure, still the addition of 3 to 4 cwt. of guano and some salt gave me a good profit over and above the payment for its cost. The same remark applies to wheat; by omitting to guano it at a cost of 30s., I lost a quarter of wheat and some straw. One can hardly overrate the benefits conferred upon the farmer who applies to exhausted soils an ample supply of artifical manures. Rape and cotton-cake are excellent fertilisers. These remarks hold good for grass lands, which are too often sadly neglected and robbed. Many a farm might be converted from an unprofitable to a profitable condition by the use of artificial manures.

The want of Sound Middle-Class Education.—The establishment of middle-class colleges promises to effect a great good. A sound and suitable education is much

needed among farmers in certain districts—agricultural literature and examinations should certainly form a prominent part of such education—and then we might expect to find in each farmery a small but useful library of agricultural books, containing the valuable experience and advice of good and clever men who are no longer with us. How rare one sees such a library now! A score of pounds so invested would form a profitable speculation. The Royal Agricultural College and the Glass Nevin Schools of Ireland have already been fruitful of result.

In conclusion, there is, in perspective, a grand future for British agriculture, not merely by the reclamation of waste land, for of that there is but little left, but rather by intensifying our farming—by concentrating capital in a limited area. Taking out of view individual capability, which must ever vary, our general system will be based on commercial and manufacturing principles, looking rather to result than to cost. Education, intercourse, and intelligence, goaded by foreign competition, will cause our agriculture to emerge from its ancient customs and feudal restraints. Set free to act, the national character will exhibit in this—as in manufactures, commerce, and railways—a vigorous, I would say a gigantic, action. But all this can scarcely be effected without a remapping of the country. Our crooked ways and cramped and wooded enclosures must give place to rectilinear extension, but not bare or untimbered enclosures. The feelings of enthusiastic lovers of old landscape will no doubt be somewhat outraged, but the pleasures of the eye must subserve the imperative demands of the British stomach, for if that is not duly and cheaply filled, suffering will produce discontent, and then will follow its usual numerous concomitant attendant evils. I am not of opinion that it is desirable to depend upon foreigners for our food any more than for our manufactures. If we have the means to produce all or most of it at home,—and I know that we have, if we choose to apply them,—then we should put our shoulders to the wheel, and resolve that the agricultural carriage shall move faster, and that we will set to work in earnest to remove the obstructions that impede its progress. Landowners should lead the way, supported by capitalists, and then the sturdy British yeoman will not be found wanting in the good work of cheap and abundant production.

Mr W. Walton (Chowton Park, Alton) said he wished to mention some of the causes which tended to render farming unprofitable. First, Want of security: This was the most important thing on entering upon a farm. No man could farm to advantage without having good security for the outlay of his capital, either by a long lease or good tenant-right, or both. For instance, when a man entered upon a farm in a dirty, impoverished state, which was an every-day occurrence—a farm which was wet, cold, full of couch, and other weeds, and had never been half-ploughed, or cultivated, or manured—what had he got to do? To lay out most of his capital before he could get any return. Was there a man who would submit to this without security? 2d, Want of commercial principles: To prevent any dispute, all agreements and engagements should be in writing. (Hear, hear.) 3d, Want of good and sufficient buildings for stock and implements. (Hear, hear.) This would come home to a great many. Every good farmer should make out of his farmyard one-third or half of his rent. All implements should be pnt under cover in the winter, and this could not be done without proper buildings and conveniences. 4th, Want of equality of rates and taxes: Government was desirous that all should pay their fair share of rates and taxes. This would not be, however, the case until the farmers and others who paid taxes had a voice in the expenditure of the same. He was sorry to say that since the new law of rating parishes came into operation the committee had found very great inequality in the mode of rating land and buildings. 5th, Want of a reduction of game and rabbits. (Hear, hear.) All farmers should have the full benefit of the produce of their farms, and not see it half-eaten by game and vermin. 6th, Want of double hedgerows grubbed, and timber growing upon the same cut. This was a great hindrance to good cultivation, particularly where steam was used, and an encouragement to all kinds of vermin. 7th, The want of all burdens and impediments to good husbandry being done away with, particularly the malt tax. (Hear, hear.) No impediment should be left in the way of good cultivation, especially as regards the production of food for the people. Why should the product of our lands be so heavily taxed, and that of foreign countries free? This would rest with the farmers at the next election for M.P.'s. (Laughter.) 8th, Some would add want of capital: If the farmers had security, or a long lease, sufficient capital would be forthcoming; but what could be expected under tenancy-at-will, a landlord's law of preference, and high rents? 9th, Want of political influence on the part of farmers: This might appear to some

of no importance; indeed, a great many renting farmers had told him it was not their bread and cheese. He concluded, however, that if farmers were to do as other men did, to exercise proper control over the choice of members of Parliament, they would soon get rid of the malt-tax, half the county rates, and all other unfair burdens they now had to contend with. (Hear hear.)

Mr Edmunds (Rugby) said, having come there that evening hoping to hear something new, he must confess he had been rather disappointed. If he might describe the worthy Alderman, he would say that he was a sort of rough pioneer for agriculture. (Hear, hear.) He went out with his pickaxe, and broke ground in all directions. He began with sewage, and he had ended with it, and the result was not yet satisfactory. In his opinion, the Alderman did not lay sufficient stress in his papers upon the evils which pressed most heavily upon farmers. He (Mr Edmunds) agreed with the last speaker, that want of security in the holding was the greatest cause of want of success. If a farmer held land on a secure tenure for a certain number of years, he could then farm at a profit. There were some tenant farmers who had something like security under a good landlord; but, speaking generally, he must say it was the want of proper security which kept farmers back. (Hear, hear.) The Alderman had described almost every evil under the sun as an evil which affected farmers; but, in reality, most of the evils to which he alluded, belonged to trade and professions as well as to agriculture. For example, if a man did not possess sufficient knowledge, he would not succeed in anything, whether in agriculture or in commerce; men must be educated or prepared for their callings. So also sickness was, of course, one of the "ills that flesh was heir to;" it did not belong to farming life merely, but was common to humanity. A lease was the first thing that a farmer wanted, as a farmer. The next requisite was, perhaps, that the farmer should really have the benefit of what he paid rent for. When a man took land, he ought, in a certain sense, to be able to do what he liked with it; and this could not be the case if his landlord stocked it for him with game. Having lived among farmers all his life, he had never met with one who would not be glad to see game on the land he occupied, provided it were not there in excess; but if the farmer were expected to keep game at the cost of his own pocket for other people's pleasure, he naturally felt dissatisfied. It might be said that there were two parties to every contract, and that it was the farmer's own fault if he entered into a contract which was bad for himself with his eyes open. It should, however, be borne in mind that there were many families which had been for centuries on the same estate. They had, perhaps, lived under a succession of good landlords. At last there came a needy man, who began to cultivate game excessively. The farmer had no lease; and what did he do in this state of things? Why, he had a strong affection for the home of his fathers; and there he stuck till perhaps he had hardly anything left. (Hear, hear.) Another evil was the present system of administering county rates. Farmers, he believed, paid more proportionately under that head than the inhabitants of towns; and surely those who paid the money ought to have a voice in the spending of it. (Hear, hear.) Further, he thought that farmers had the same right as every other class of the community to demand that all protection and restrictions which affected them should be done away with. They had a right to do what they liked with the grain they produced. If it were objected that the tax to which he alluded was useful revenue, then he replied that so also was the tax formerly imposed on corn, yet its usefulness in that respect was not considered by those who wanted to have it abolished. If they wanted the malt-tax taken off, they must not be quite so thin-skinned as they had been; it required a pretty thick skin to agitate so as to get a tax like that repealed.

Dr Voelcker said they must all have listened with great pleasure to Alderman Mechi's paper. Their worthy friend had said so many good things, so many spicy things, so many profitable things, that one felt loth to enter upon the disputable portions of his remarks; but still, as the introducer of the paper, he would not look so much for mere compliments as for honest conclusions, and even at the risk of being considered captious he would allude to one or two disputable points. When the worthy Alderman commenced speaking on the subject of sewage there was considerable merriment. He remarked very justly that that subject was one of great importance. No one could deny that an immense quantity of valuable fertilising matter was annually swept away and lost. The question was, how was that valuable matter to be utilised. (Hear, hear). He (Dr Voelcker) would like to hear something tangible as to the manner in which that was to be done. (Hear, hear.) They had been told that the

time would probably come when the farmer would merely have to open the sewage tap, just as the tap was now opened to let the gas out. But there was this important difference between gas and sewage, that if they opened the gas tap they got a splendid light at a cheaper rate than oil, wax, or candles of any description could be supplied; whereas, if the sewage tap were opened it was very questionable what profit there would be. (Hear, hear.) They might, indeed, get a very large profit; but on the other hand, there might be nothing to pay for the outlay on the pipes. (Hear, hear.) Now, that was a question upon which there was still required a great deal of information; it was a question which could not be settled in a general way, (hear, hear;) it was a question which depended especially on the character of the land. Whatever might be said about the wildness of the scheme of sending the metropolitan sewage down to Maplin Sands, at least this might be affirmed, that the land there was just the kind of land that was most likely to be benefited by sewage, (hear, hear;) for just in proportion as land was poor and hardly capable of producing anything was sewage likely to be good, and just in proportion as land was naturally fertile was sewage unlikely to prove beneficial. He would be a very hazardous farmer who, having good pasture land, poured upon it a large quantity of sewage manure, thereby converting it into that sort of rye-grass land of which Alderman Mechi had spoken. He (Dr Voëlcker) would not deny the utility of sewage rye-grass for the keeping of stock in good condition; but he maintained that pasture grass was better, and he would appeal to those who had had more experience in this matter than himself, having resided only for a few years in the country, whether sewage did or did not increase the nutritive value of produce. He had on former occasions contended against his worthy friend (Alderman Mechi) on this point. His own opinion was that the more rapidly you forced produce of any kind the less nutritive it became, bulk for bulk; the slower it grew the more nutritive it was. On pasture lands that was especially the case. By applying sewage to the land they gradually reduced the herbage to one or two predominant grasses, favouring the growth of the coarser kinds to the destruction of the finer, (hear, hear;) one particular grass—a coarse one—often prevailed. They all knew that in mixed herbage they had a variety of grasses, and that, bulk for bulk, those mixed grasses were more nutritive than the succulent produce which consisted of one particular kind of grass.

KELSO FARMERS' CLUB.

IMPORTANT DISCUSSION ON THE LOUPING ILL.

At a meeting of this Club, held in the Cross Keys Hotel, on Friday last—Mr Gilbert Stuart, Runningburn, in the chair—the subject introduced for discussion was, "What is the cause of the disease called 'louping ill' in sheep, and the best preventive or cure?"

It has not been usual for this Club to publish any part of their discussions; but on the motion of Mr Purves, Burnfoot, seconded by the Chairman, and the unanimous voice of the company, Mr Usher and Mr R. Robertson, who were the principal speakers, were requested to deliver their remarks to be reported, to which they consented, in the hope that, as the subject is one of great interest and importance, other Clubs may be induced to discuss it, and perhaps lead to the better understanding of this hitherto most mysterious and fatal disease.

Mr Usher, Stodrig, said—I proposed the subject for this day's discussion in the hope that I might pick up some information rather than impart it, as it is one of which I am comparatively ignorant. In the short experience I have had of the disease called "louping ill" in sheep, I have, however, undergone rather a severe ordeal, which naturally induced me to investigate the nature and causes of the disease, with a view to its prevention. You are, I dare say, all aware that at Whitsunday 1863, my son and I entered to a farm in Rule Water. We were not ignorant of the said farm being liable to "louping ill" in sheep, but certainly had no idea of its extent; besides, the disease seems to have been more virulent during the last two years than for a considerable time previous. Our predecessor in the farm had an unusual heavy loss before Whitsunday, when we entered to the stock rather in poor condition at a valuation, and after that our loss was also considerable. This led us to look to the previous management of the stock for some supposed error which might perhaps have led to such an unfavourable result. We found that the ewes while lambing had been con-

fined to a moor field, getting a few turnips on grass up to a certain day in May, when a part of them were turned to the hill, to which the disease was chiefly confined, and on which at this season there was a great flow of grass. Knowing, then, little or nothing of "louping ill," we attributed the loss more to the rapid transition of the stock, while in poor condition, from middling keep to too luxuriant pasture, and thought by guarding against such extremes in another year, we might at least ameliorate the virulence of the disease. Under this impression we commenced to get the stock well up in condition by using turnips, of which we had a fair crop, very liberally, and giving oats, in addition, to the flock. We brought them through the winter in first-rate order. We had, in consequence, an extraordinary crop of lambs, the ewes during the lambing season still getting a few turnips on grass, and all went on to a wish till about the middle of April. We then began to remove the ewes and lambs in small numbers, according to their strength; those with double lambs to young and improved grass, those with single lambs to the hill. I may here mention that the former, beyond a few casualties incidental to every breeding stock, continued to do well during the whole season. As there was no great luxuriance of grass on the hill, the stock were, in addition, supplied with a small quantity of oats daily. They appeared to do well enough for about ten days or so, when, in a single night, several ewes and lambs were attacked with "louping-ill," and the disease went on, varying in intensity according to the state of the weather, till about the 10th June, when it gradually abated. It was not in all cases fatal—several ewes and lambs slightly affected got round, after losing a great deal of condition; but whenever they got what is called "grounded"—viz., completely prostrated, we had scarcely a single case of recovery. We tried purgatives and stimulants of various kinds, with no benefit whatever. We had a very heavy loss of both ewes and lambs, and setting aside the question of "profit and loss," altogether it was a most pitiful sight—in fact, the hill looked somewhat like a district infected with a plague. A man who acted as assistant to the shepherd in lambing time, and had done so on the same farm in previous years, told me that according to his observation, the disease began to shew itself just about ten days after the stock was sent to the hill. Regarding the cause of the disease, every one seemed to have his own theory. The top of the hill is good land, producing fine grass, but from the sheep naturally drawing up to it, is somewhat foul, and by some thought to induce the disease. The circumstance of the great majority of deaths taking place on this part of the ground seemed to favour this opinion. Others attributed it (I fancy with more truth) to a tract of rough white grass land about the middle of the hill; while others again blamed a piece of improved moss land at the bottom. Somewhat bewildered by the collision of so many opposite opinions, we gladly accepted the offer of a medical friend in Kelso, who kindly volunteered to proceed with me to the scene of the calamity, and investigate the case. We had no lack of subjects to operate upon. He carefully dissected the brain and spine of several, and found them in a comparatively healthy state; but in every case found the first stomach gorged with a large mass of undigested food; and in the second, nothing whatever but a little brown-coloured liquid. He was clearly of opinion that the disease originated in the stomach, probably from eating the dry white grass formerly alluded to, which we found in large quantities, undigested, forming something like a mass of plaster hair, and so preventing the sheep from ruminating or chewing the cud. We know that in the human subject, the stomach is the seat of many of "the ills that flesh is heir to"—so in the sheep, derangement of the stomach, if not checked in its first stage, may ultimately resolve itself into paralysis, prostration of the whole system, or, in other words, "louping ill." I may here mention a peculiar feature attending this mysterious disease—viz., its being almost invariably accompanied with "ticks" on the sheep. When the ewes and lambs were turned out to the hill, no such thing as a "tick" was to be found on them; but after a very short sojourn there, they were to be found in great numbers, and often distended with blood to a great size. This has led many to believe that these parasites are the cause of the disease. My scientific friend and I differed somewhat in opinion regarding them; I maintaining that the ticks must be located in the grass on the hill, and so communicated to the sheep; while he scouted the idea, and said that, if in the grass at all, they must first be produced on the sheep. He upheld his opinion by giving me the aid of a very powerful microscope, and challenging me to find a single tick in the grass; while I retaliated on him, and defied him to find a single tick on the ewes and lambs in the lower fields; and let it be borne in mind, they had all been in one

flock during the winter. In each case we were unsuccessful in finding *one*. I still adhere to the opinion that they are in the grass; but although the tick seems to me to be an invariable concomitant to "louping ill," and may also be an aggravation of it, I am quite convinced of the correctness of my friend's theory, that it proceeds originally from indigestion. The two following cases have very much tended to confirm this opinion:—In the end of July we brought home six scores of half-bred gimmers, purchased in Caithness, and put them into a field we had taken for the season in the neighbourhood. The said field was understood to be liable to "louping ill," but it was kept clean for them, and the season of the year was thought to be past for its ravages. Under these circumstances, we expected to keep the gimmers in it for three weeks or so with impunity. In about ten days, however, several were found affected, but only one "grounded." This one died; but the others, on being immediately removed to a young grass field, in a few days recovered, and are all alive and healthy to this day. The second case is similar. About the month of September, the disease again showed itself among the ewes on the farm, probably in consequence of the protracted drought. A few died, their stomachs being in the very same state as those early in the season, and a considerable number were affected. We at once began to give them a very small quantity of turnips daily, when the disease was immediately arrested, and we have not since had a single death. I may here mention that we attributed the severity of the disease in spring also to the unusual dryness of the season. I come now to the all-important question—What is the probable preventive of this dreadful malady?—and if we are correct in our hypothesis about the cause of the disease, this ought not to be very difficult of solution. I shall now tell you what we have done, and propose to do. Before the commencement of our lease, the said hill was pastured with sheep only. Being left very rough, the coarser grasses naturally predominated, and usurped the whole ground, with the exception of the hill top, which was eaten bare. Since our entry to the farm we have grazed a good many cattle on the hill; the said rough grasses are now eaten nearly bare, and where they are not, we intend, as early in the spring as practicable, to burn any part remaining which may still be too rough. We find from the experience of last year, that whether eaten with cattle or burned, it affords a bite for sheep sooner than it did formerly, when the grass had to force its way through a large mass of fog and fibre. Besides, the texture of the grasses was much improved, the finer sorts coming away, particularly white clover, which is indigenous to the soil. Next year, and the year following, we propose throwing out again to grass without a crop two fields of about twenty-five acres each, and likewise improving other portions, so as to give the stock a variety of herbage. As this, however, is a work of time, I shall tell you what we intend to do in the meantime, and then conclude, having trespassed already on your time much longer than I anticipated. We are at present storing on the hill a considerable quantity of good sound green-top yellow turnips. With these we propose to supplement the food of the ewes next spring, when turned out, through the month of April, and as far into May as we can preserve them. While the turnips last, we mean to teach the ewes to eat linseed-cake, newly made and of the best quality, and continue to give them from a half to three quarters of a pound daily till about the middle of June. If we are right in the origin of the disease, I fancy we are warranted to look with confidence to this treatment producing an amelioration, if not a perfect cure. And if the system be successful in saving life, the cost will be very trifling indeed, if anything at all; for it will improve both ewe and lamb, increase the quantity of wool, and, if persevered in for a few seasons, improve the grass both in quantity and quality as much as any top-dressing that could possibly be applied. There are other points on which I shall not enter. For instance, on the opposite side of a march-dyke, land forming part of the same hill, and formerly liable to "louping-ill," is said to be perfectly cured by a top-dressing of lime. If so, I think I am consistent in supposing that the result arises from the circumstance of its *eating barer*, and so producing more succulent and digestible grasses; and I purpose to arrive at the same happy consummation by other and cheaper means. Not having tried it myself, however, I leave some one to speak on this point that can do so experimentally.

Mr R. Robertson, Ladyrig, then spoke as follows:—After the able manner in which Mr Usher has handled this subject, I should have considered it quite unnecessary to rise on the present occasion, were it not that his remarks refer entirely to half-bred sheep; and although the disease is the same, I think the effect different upon Cheviot sheep. Of all the diseases that infest our flocks, there are none that

commit such devastations as the one referred to; and much as we owe to veterinary science, we certainly cannot in this case give it the credit of ascertaining either cause or remedy. I do not dispute that much may have been done to find out the root of the evil, but I say it is a glaring fact that thousands of our sheep are buried in the earth every year unfit for the use of man or beast; and certainly a greater interest ought to be taken to find out the cause and remedy, as there is no disease more fatal, and, I am sorry to say, none that we are more ignorant of. As is naturally the case with a disease so fatal, many causes are given for it. It is alleged by some, that a plant natural to certain districts contains the root of the malady; that the sheep eat that plant in the spring, take the disease, and die. If so, it is evident that that plant must only prove fatal when eaten in the spring, as I have had sheep upon a hill all winter, and never take it till that season; and, again, I have frequently had sheep entirely off the hill for two months, and, when put on in the beginning of April, take the disease. In both cases the sheep take the disease in the spring, with this difference, that those that have been on the hill all winter are more apt to die than those that have had a change for two months; and the reason is obvious. If you clear your hill and give your sheep a change on turnips for two months, they return in better condition, and therefore more able to resist the disease than if they had not had that change. As a preventive to the disease, I certainly would recommend the ewes to be taken entirely off the hill for two months and put on turnips on the best clay land; and doubtless the condition of your sheep will, in my opinion, be so much strengthened as to resist the disease to that extent that you will save life. The quality of your lambs will be deficient unless you bring the ewes on to better meat, such as young grass or fresh fields, as the milk goes off them for some time after they recover. If you approach a ewe or lamb affected with the disease, they will never move till you almost touch them, when they spring up quite paralysed and fall, repeating it as often as you approach them—hence, I suppose, the name "louping ill." In such cases it is certain to prove fatal. I only once saw a ewe "grounded" and get better. Perfect quietness is necessary. Hill herds have tried many cures, but I don't think they ever succeeded. Medicine seems to have no effect in loosening their bowels. In the year 1860 (a very memorable one) I kept all the stock on the hill throughout the winter, and gave each sheep a pound of oats and lentils. They were in much thinner condition than they usually are, but the deaths were small considering the year, my loss being ten old sheep. Now, many may say your sheep got no change that year, and your deaths were trifling. Yes; but I attribute the saving of the stock entirely to giving them a pound of oats and lentils from the commencement of bad weather till they were all lambed. A pound of oats and lentils given to each sheep the first thing in the morning induces them, after resting, to scatter over the hill and *pick* their food, thus keeping them healthy, although in poor condition. A very remarkable circumstance in regard to "louping ill" is the fact that, whenever I have had it on Lustrutherhill, it has always been on one particular ridge of land, and that the barest eating and earliest. A few years ago, the Hon. W. Elliot of Wolflee applied for leave to botanise that portion of the hill, to see if he could discover any particular plant, but I have never heard of the result. Another very curious thing happened two years ago. I have a field of seven acres under cultivation, which has been drained and limed, and into it I put a score of ewes and double lambs, and in less than a fortnight I lost six ewes and ten lambs. The ewes were never on the hill, but getting turnips in another field till they lambed, and, having double lambs, I put them into the best grass I had. I removed the remainder into another field, and no more deaths occurred. If the field referred to had not been drained and limed, I would not have wondered at the presence of the disease, but as it is so, it displaces all hope in my mind that lime is a preventive. I have often noticed that, if you bought Cheviot hogs or ewes and put them on a diseased hill, you will lose more of them than you will of the stock that is reared on it. It does not confine itself to sheep altogether, as both cattle and horses frequently take it. I have seen them covered with ticks, which is another curious omen of the disease; for where ticks are, there, you may depend upon it, is "louping ill." If you examine your sheep in the spring and find ticks, you may lay your account for the disease. Whether ticks have anything to do with the disease is a question I cannot answer. Certain it is, that where the disease is there is the tick. There are many mysteries in the disease, and I sincerely hope that those men who stand high in veterinary science will put their shoulders to the wheel, and, with that encouragement which I can guarantee they will get from every sufferer, surmount the evil, giv-

ing us both cause and remedy. They will then place us in that happy position that we will have it in our power at least to save some; and I am sure we will give every encouragement in our power to have both the land and sheep thoroughly examined.

Several other members afterwards joined in the discussion, and generally approved of the views expressed by the preceding speakers. Mr Usher said he saw nothing in Mr Robertson's remarks opposed to his own opinion regarding the cause of the disease or its remedy. The meeting generally assented to the feasibility of Mr Usher's views, and looked forward with much interest to the result of his experiment.

OBSERVATIONS ON THE EFFECTS WHICH ARE PRODUCED BY FEEDING CATTLE AND SHEEP EXCLUSIVELY ON TURNIPS.

By A. J. Murray,

Professor of Veterinary Surgery at the Royal Agricultural College, Cirencester.

An examination of the conditions which favour the production of disease is of the greatest importance to farmers. The following remarks refer more especially to the effect produced on the system by the exclusive use of food composed of a single species of plants. I am well aware that among the more advanced agriculturists the advantages of a mixed diet are recognised. My own experience, however, is that many agriculturists are not aware that food must supply to the blood a sufficient proportion of organic principles, and that if these are not supplied in sufficient proportion, disease will result. It is true that the farmer may gain such knowledge by experience, but it must be acknowledged that such a method of acquiring information is rather expensive. It is desirable, then, that the experiments of a few persons should be of service to the public, so that others may not be under the necessity of acquiring information practically but painfully.

The turnip, according to Dr Voelcker, contains from 88 to 92 per cent. of water. It contains a very small proportion of the nitrogenised or flesh-producing matters—only between 1 and 2 per cent. The proportion of water is excessive, while the albuminous compounds are very deficient; and these two peculiarities explain why the exclusive use of the turnip, as an article of food, is attended with such bad results. By comparing the composition of the turnip with that of the grasses, which may be regarded as the natural food of the sheep and ox, its deficiency is very marked. The proportion in which nature has combined the various nutritive elements in the natural food of those animals must be adopted when they are kept under artificial conditions. The frequency of disease will thus be reduced to a minimum.

The disadvantages of a diet consisting exclusively of turnips are—1st, That the introduction of a larger quantity of water into the system, which in winter is frequently as low as 32° F., and must, when taken into the stomach, be raised to a temperature of at least 100° F., must greatly increase the consumption of the carbon and hydrogen compounds supplied to the blood in the food. The carbon and hydrogen consumed in this way are furnished by the oleaginous, starchy, mucilaginous, and saccharine principles of the food which have not been converted into tissue, and also by the disintegrated tissues themselves. A portion of the food which under more favourable circumstances would have increased the animal's bulk is thus expended in maintaining animal heat, the wear of the body being at the same time accelerated.

2d, The digestive fluids are excessively diluted, so that digestion is imperfectly performed, and the nutritive elements which the food actually contains are not thoroughly dissolved out, and they consequently pass through the intestines with the innutritious matters. This frequently induces chronic disorder of the digestive system.

3d, The turnip, as has already been shown, contains but a small proportion of the albuminous or flesh-forming constituents. The loss consequent on the wear and natural decay of the particles of the tissues is repaired by the incorporation of new nutritive principles into their substance. This process, however, can only be perfectly carried on when the elements contained in the food are identical with, and bear a certain proportion to, those contained in the blood. When the proportion of

any one of the nutritive elements is deficient, the blood does not obtain a sufficient supply of new materials, the wear of the body exceeds the process of reparation, and the animal consequently sickens and dies.

4th, Turnips are also injurious from the influence which such cold watery food exercises in depressing the action of the nervous system. The power of resisting depressing influences is thus impaired, and all the functions of the body are feebly performed.

The nutritive value of the turnip is frequently reduced to a minimum by causes which I have not yet mentioned. The detrimental effects of frost and mildew on its feeding qualities are well known to the farmer. Turnips which have run to seed, and which consequently contain a large amount of woody fibre, are also innutritious and indigestible. In the disorders which have come under my observation, and which I have been able to trace to the exclusive or the excessive use of a turnip diet, I have occasionally noticed that the turnips were affected by one or other of the above causes. Chronic indigestion and blood diseases are the usual results of such a diet, though we may have the one condition complicated by the presence of the other. The blood disorder consists chiefly in a diminution of the plastic or tissue-forming elements, and we may then have a disintegration of the blood globules which appear in the urine, giving it the red colour which is popularly known under the name of red water. In ewes and cows the effects of such a diet are usually noticed shortly before calving and lambing, and occasionally only after parturition, when the copious secretion of milk removes a large portion of the nutritive elements of the blood. This diet produces more injurious and fatal effects on female than on male animals, owing to the materials removed from the blood by the rapidly developing fœtus during pregnancy, and by the secretion of milk after parturition.

A case illustrating my previous remarks has lately been brought under my notice by a farmer. His ewes were taken from the ram during the first week in November; they were then fed exclusively on turnips until the period of lambing. They appeared healthy, and even fattened well on this diet until about a fortnight before lambing, when some of them began to look dull, and they also gradually became weak. It was necessary latterly to have them in the fold, as they could not walk to the field, which was only 600 yards distant. They lay down in the yard until they lambed, after which some of the weakest ewes died in from one to three days. Some recovered after careful nursing and the administration of stimulants. The ewes most severely affected invariably had twin lambs, and though the lambs when dropped were tolerably strong, in a few days afterwards they generally sickened and died. In such cases nutritious food—such as hay, oats, and oilcake—must be given, combined with the administration of tonic and stimulant medicines. It will frequently, however, be found that the weakness induced by such a system of diet is so great, and that the digestive functions are so impaired, that the animal has no appetite for food. These lines, however, have been written not so much for the purpose of recommending treatment in disease, as for the purpose of preventing disease. The importance of studying the causes of maladies was well estimated by Professor John Gamgee, when he said at a recent lecture at Edinburgh :—" Veterinary medicine is something more than the art of healing sick animals; it is the art of preserving animals from sickness."

SALVING AND DIPPING SHEEP.

PENICUICK AGRICULTURAL SOCIETY.

A MEETING of the members of the Penicuick Agricultural Society was held on Friday evening in Stewart's Inn, Penicuick—Mr Penman, Bonally, in the chair. The subject for discussion was "Salving and Dipping Sheep."

The Chairman called on Mr Wilson, Crosshouse, to open the discussion.

Mr WILSON said—I believe it will be allowed by almost all stockholders that some dressing should be applied to sheep, either by smearing, pouring, or dipping, at least once in the twelvemonths; but this being acknowledged, a great diversity of opinion seems to prevail, both regarding the ends to be served by the operation, and also in regard to the materials employed as dressings. Every one, I daresay, believes that the destruction of keds with which sheep are so universally infested, and also the destruction of the scab insect, which often does incalculable mischief, are important ends to be served by the operation of dressing; but to what extent applications affect

the health of the sheep or the growth of wool, apart from the destruction of vermin, is perhaps not so clearly decided. In opening this discussion, I may state that I have had trials of a good many substances alike in smearing, pouring, and dipping, comprehending mixtures of simple substances, as well as the most of the compositions offered by different parties to the public. I would, however, in drawing conclusions from my experience, remark that a dressing suited for sheep in a mild and sheltered district may be unsuitable for those that have to bid defiance in an elevated situation to the pitiless storm. In high and mountainous districts the comparisons we draw would not apply; as, however much pouring or dipping may be satisfactory here, smearing of one kind or another may be necessary for the protection of the flocks through the severity of winter in exposed regions. I consider it is very doubtful whether any application to the skin of the sheep will encourage the growth of wool in the same way as crops are benefited by an application of manure; but of this we may be quite certain, that dressings are often applied of a nature that, by washing out the natural yolk of the fleece without supplying its place, the growth of wool may be checked. At one time I was in the habit of applying black soap liberally, both in pouring and dipping, but have now come to the conclusion that it is of too washing a nature to be recommended. In examining the fleeces of sheep eight or ten days after being poured or dipped with tobacco juice, spirit of tar, and black soap, which is a very common, and, as far as regards the destruction of the vermin, a very effectual application, I have found of course the colouring of the tobacco and spirits of tar, which is not easily washed out, but what has come of the soap? The frothy greasy-like nature of the dip has disappeared, and should a drenching rain have intervened, I have found the scouring very effectual; the yolk being washed out, and its place not supplied till nature creates a new supply—a process which in cold weather especially is very slow. In this state the wool feels hard and dry, and judging from appearance its growth suffers. If the growth of wool can at all be promoted by artificial dressings to the fleece, there can be no doubt but this will in the greatest degree be accomplished, the nearer the composition employed approaches in its character to the natural yolk existing in the wool. Oily or fatty matter should, in my opinion, enter into the composition used; but in reducing these to a workable state for pouring or dipping, I believe they are often saponified to such an extent that they can in no degree be impervious to water, and are therefore liable to be washed from the fleece, more especially if heavy rains immediately succeed their application. This fact is no doubt in favour of smearing, as a salve, although saponified to some extent when applied to the skin, under a good covering of wool, along with the natural yolk which has not been washed out, will be found to repel external moisture, and I believe has the effect of lessening the conducting power of heat, thereby preventing the heat of the animal's body from escaping. In exposed mountainous districts, I am quite of opinion that smearing of some sort is generally beneficial, and some of the white smears now in the market are superseding in some districts the old smear of tar and butter. One great drawback to smearing is the tediousness of the operation; it is also in general very expensive; and I must say it has often proved with me inadequate in destroying vermin, not perhaps so much in every case from a deficiency in the materials employed, as in the difficulty of getting it thoroughly over the skin, so as to prevent the keds making their escape to some undressed portion of the fleece. I have found this difficulty greater when using the white smears now in the market, than from the application of those formerly in use. I must say, as far as my experience goes, there is still great room for improvement in some of the compositions offered for smearing purposes, but I am sanguine that if practical and scientific men go hand in hand in making experiments, stockholders will by-and-bye be less liable to annoyance and disappointment from failure in the results of their sheep dressings. The health of the sheep and production of wool have to farmers become more than ever worth the attending to, for while the price of grain has been reduced to a point that will never pay its cultivation, mutton is high, and wool is commanding higher prices than we have ever been accustomed to. Great encouragement is therefore given for paying attention to this department. I stated before that I was very doubtful if we could produce a growth of wool by any application to the skin; but we all know that some dressing must be applied for the preservation of our flocks, without which a diminution of wool would evidently take place, consequent upon the health of the sheep suffering from annoyance, and from the constant tear and wear of the wool from the animal's endeavours to rid itself of its tormentors. Loss of wool may also be occasioned by the application of substances hurtful to the sheep, or from

the wool being too thoroughly scoured from the washing nature of the substances employed; and I believe not the least consideration is the improving or deteriorating of the quality of the wool. From the prices I have myself obtained at the public sales, where, from the competition, wool is likely to meet with a purchaser at its real value, I have seen a material difference in the return, consequent upon the materials that have been used in dressing. It must, therefore, be a desideratum to produce our wools in a condition best calculated for being fabricated into a class of goods that will bring out their greatest value. By giving our experience, and stating our views on the subject, I consider we, as members of this Society, will be most benefited by confining our remarks to our own practice; and allow me here to state that what I say will apply more to a regular breeding flock than to sheep merely for feeding purposes, knowing that others who will take part in this discussion have had better opportunities than I have had of arriving at correct conclusions on this part of the subject. I mean my remarks also to refer to what suits the district of country within our range, which I reckon of medium altitude; for although our hills rise to an elevation of nearly 2000 feet, they cannot be said to be very much exposed, as in general we have good natural shelter. Therefore, considering that the greatest benefit to be derived from smearing is the protection of the sheep in severe weather, I, for my part, cannot think that at our elevation there are sufficient benefits to be derived from this mode of application to urge its adoption. I am now, after many experiments, confining myself entirely to dipping, and have for the last few years avoided all compositions containing, as far as I can ascertain, arsenical or mercurial ingredients. When using compositions containing these substances, I am confident I had good reasons for believing that my sheep were to some extent injured. I know this, that they evidently got broken mouthed sooner than sheep that had been differently treated. I may state, however, that I would not expect that result to show itself so much in every case as it does with me, as my hill sheep have a little tendency to that at any rate, but if it affects them in that way at all, as I have good evidence for believing, it must, no doubt, to some extent tell upon their constitution. I have this autumn dressed the greater part of my sheep with "M'Dougal's sheep dip," and "Girdwood's Melossoon." Having used M'Dougal's dip to some extent for some years back, I have reckoned it one of the best dips, although I admit it did to some extent discolour the wool. I used the Melossoon as a second dressing to a portion of my sheep last winter, and with entire satisfaction regarding the appearance of the wool, which opinion was corroborated by the fact that the clip of these sheep brought the very highest price in the market. In regard to destroying vermin, however, the dressing was not quite satisfactory. In other trials I made during summer the results were very much the same. I believe, however, since that time some alteration has been made in the composition of the Melossoon, and having dressed nearly the half of my flock with it in the beginning of November, I can without hesitation say that the result is very satisfactory. A live ked is now scarcely to be seen, the wool is very white, and there is a richness and mellowness in the touch which I have not seen equalled from dressing with any other composition. I am afraid I am taking up too much of your time, but the importance of the subject induces me to make one or two further remarks upon the permanence in the results of our sheep dressings. I believe some of you will agree with me in thinking that we have a tendency to be too sanguine. To protect our flocks during the whole time they are growing their fleeces, will it not have to be admitted that at least two dressings ought to be applied to rid them of vermin thoroughly? I know I have never been able to keep the keds in abeyance otherwise. I have found this to be the case particularly in my young sheep, and even my regular flock of ewes have been benefited by receiving a dressing shortly after being clipt, and again during the winter. In some experiments I made lately, keds exhibited a tenacity of life very remarkable. When performing my dipping I strictly adhered to the instructions given, to keep the sheep immersed a full minute. The shepherds engaged in the operation naturally thought it tedious, and seemed to think that the vermin would be drowned were they simply to be immersed in cold water for such a length of time, but the fact is, they will scarcely drown at all. I collected a number, and put them in cold spring water for different periods, up to forty-five minutes, and when taken out, although they seemed dormant for a time, when brought into contact with heat they began to move about, and were soon as lively as ever. I took from the dipping-trough a bottle of the different dips as I used them, and collecting a number of keds, I made several trials, to ascertain the killing power of the dips, and also to test the comparative

certainty of the destruction of the keds when subjected to immersion, with or without being enveloped in wool. In these trials I found the killing power of "M'Dougal's dip" and "Girdwood's Melossoon" nearly equal, and will only give the result of experiments with the Melossoon. All the keds immersed up to two minutes in the dip lived when allowed to dry after being taken out, and all enveloped in wool died, even down to simple immersion, when allowed to remain in the wet wool afterwards, thus proving that sheep with a good quantity of wool may not require to be kept so long in the bath as sheep that have been more recently shorn, and that have consequently little covering of wool; and it shows also the importance of being careful to have the whole sheep immersed, so that no portion of the wool may be left dry on which keds may find refuge. I do not think that the operation of dipping should ever be performed in less than half a minute to each sheep, more especially if fatty or oily substances are used. I consider that independently of killing the vermin, the wool softens and absorbs the dip the more the longer it is immersed, even up to one minute. In examining sheep that have been hurriedly immersed in a bath and pushed through at the rate of eight or ten scores in the hour, and comparing them with others that have been kept in the bath for one minute, a decided difference will be seen. In the one case the yolk no doubt has been washed out, but the wool is hard and fibry, and the dip is not absorbed; in the other, the wool is soft and mellow, and exhibits convincing proofs that it has benefited by the operation. Other ends are also to be served by doing the operation slowly; while the wool softens, the eggs of the keds that are lying loose in the fleece escape into the bath in great numbers, which cannot be the case in the same degree when the sheep are merely plunged in and out again. More time is also given for draining, which, as far as regards the saving of waste, should not be overlooked. The draining fold of my apparatus holds twenty sheep in each division; these divisions are emptied alternately, and I find that when each sheep is kept one minute in the bath, the draining is quite effectual; scarcely a drop is lost after they leave the fold, and I do think there is less loss when the operation is performed in this way, than what takes place even when pouring is practised; and the ingredients of the dressing are in my opinion more regularly distributed by thorough dipping than by any other mode of application. In drying, the watery portion of the dip evaporates, while if not too much saponified, its other constituents are absorbed and retained by the fleece. I may state that I have found great advantage from having the liquid pretty hot, whatever was the nature of the composition used, and have never seen sheep injured by too much heat, although I have generally performed the operation at the temperature of 100 degs. In closing these remarks, all I would say in regard to sheep that are to be kept for a limited time is, that a dressing that will thoroughly kill the keds, and that will prevent or cure scab, and at the same time not injure the health of the sheep, or deteriorate the quality of the wool, may be all that can be desired for this description of stock; while our regular flocks retained to six years of age should have their dressings of a greasy or oily nature, with the killing principle devoid of arsenical or mercurial ingredients. In a district of moderate elevation the ends desired will be better served by dipping than by any other mode of application, believing that the wool may be more improved, and its growth more accelerated, by the regular distribution of grease through the fleece, than by any mere application to its roots. As far as my experience goes, no simple substance will answer all the ends required, and I therefore believe that some sort of composition carefully prepared by qualified parties who are provided with the necessary arrangements for scientifically combining these substances, is what we should support and encourage. Our present duty, in my opinion, is to go hand in hand with and encourage those parties who are already providing us with the best compositions. We have more than one of our wool brokers who have taken up the subject in the most spirited manner. These parties, it must be allowed, stand in a position the most favourable for obtaining a knowledge of what is really required; learning from daily experience what quality of wool suits the manufacturers; they have also ready means of knowing the requirements of the farmer, and I for one think that, in place of throwing cold water on their exertions, we should, by every means in our power, assist and encourage them in what I reckon a most important and responsible undertaking.

Mr Murray, Eastside, said—Were it not that smearing is such a tedious operation, a mixture of tarred butter and palm grease would be found to be one of the best dressings for sheep in high situations. When butter is very high in price, mixing

with oil is often resorted to; but as it keeps the tar from closing the sheds and the wool wet the greater part of winter, the sheep in this case are comparatively out of condition in spring, and although the wool weighs heavier, there is not so much of it, for I believe that by keeping the sheep warm and comfortable, as well as by giving good food, a greater amount of wool can be grown. Mr Wilson is quite right in regard to the height of the Pentland Hills, but I differ from him in thinking them better adapted for sheep dipping than many other districts. True, they are not high, but then the whole of the Lowlands are cut off, leaving little but the hill tops compared with many hill ranges both north and south, with their long glens running into the rivers' edge, and stretching along their banks for miles. Hence it is that sheep from our district stand so well when removed to higher grounds. Dippers should let them know what ingredients they used, and what quantities, as sometimes they required to drown the keds ere they could eradicate them.

Mr Brown, Pentland Mains, said—The subject of smearing, or dipping of sheep, which was proposed at last meeting for discussion to-night, is one of great importance, when we take into consideration the large increase in the consumption of wool, the many uses to which wool is now applied, and the enhanced price it has attained the last few years. We find from statistics that at the beginning of the present century the importation of foreign wool amounted to 9,000,000 lbs., and although this has increased in 1863 to nearly 60,000,000 lbs., gives us some idea of the prosperity of Great Britain and British manufactured goods; but in a great measure we may attribute the high price of wool to a scarcity of cotton caused by civil war in the United States of America. The system of smearing sheep is now to a large extent done away with, principally on account of its tedious process; but where still practised, the wool being first shed, an admixture of tar and butter, or tallow, applied with the fingers along the shed, is the common mode. Smearing is found to have largely decreased these last three years, chiefly caused by the high price of tar and butter, also the introduction of dips designing to effect the same purpose and at a much smaller cost. There are many dips now offered to the sheep farmer, all vieing with one another in embellished advertisements, and purporting to have the desired effect. In giving a few remarks relative to their compositions, it is to me obvious, that unless the sheep intended for the application are free from scab or other eruptions of the skin, which may be caused by contagion, or arising from overcrowding in railway trucks, or on deck of steamboats, they do not cure or eradicate such eruptions. The principal dips used in this district are Wilson's, Bigg's, Elliot's, M'Dougall's, and Girdwood's Melossoon. The first three may be nearly classed alike, the poisonous or parasite-killing ingredient being arsenic: the latter, prepared I believe by Professor Gamgee, the poisonous ingredient of which is said to be the refuse of paraffin. Many hundreds of sheep have been killed in the using of dips such as Elliot's, Bigg's, &c., from an undue caution in administering them, especially during warm weather; I have only to refer you for instance to the lawsuit of Black *v.* Elliot, in 1859, upon which occasion Mr Black lost 850 sheep out of 869, by the animals imbibing part of the arsenic or other poisonous matter contained in Elliot's sheep-dipping composition. Although the evidence in this case was conflictory, it was proved that, unless administered at the rate of half an ounce or six drachms of arsenic to a gallon of water, and applied during cold weather, it was somewhat precarious. In regard to Girdwood's Melossoon, although it has not been proved dangerous, its effect on parasites and eruptions of the skin is akin with the others. The word "melossoon," I believe, is derived from a Greek word signifying "lotion to save a sheep;" and in interpreting this I would say the word is very well applied, because in many cases where used, the result went to prove that although a puncheon of this artificial yolk were applied to one sheep, the animal would be as little the worse as on immersion in cold water, and the parasites would awake as if from a stupor, brisker than ever. In almost every instance where this dip was applied, the sheep were to dip over again with a different solution, which was not only aggravating to the owner, but hurtful to the sheep. I will now, in giving my experience in the use of some of these dips, first give an outline of the class of sheep to which they have been applied. I usually purchased from two to three hundred half-bred wedders from Caithness or Ross-shire, which on arrival in August or beginning of September are found, from overcrowding on deck of steamboat or railway truck, to be heated in the blood, and showing irritation of the skin; they are usually bathed about ten days after arrival. I ventured two years ago firstly to try Bigg's, and afterwards M'Dougall's dip, according to the directions given, both of which professed to be a sure eradicator of scab or other eruption of the skin;

however, in less than ten days from application, I found I might as well have applied so much cold water. Girdwood's Melossoon has never been tried by me, and from satisfactory evidence has little chance in supplying the desideratum. The mixture I have used for some years, which when carefully applied has been found to be thoroughly effectual, is composed of 3 lbs. of tobacco paper, 3 lbs. of soft soap, 1½ quart of spirits of tar, ½ lb. sulphur, ½ lb. carbonate of soda, adding 1½ gallon of hot water to the score, costing nearly 3½d. each sheep. This solution will give the desired effect either when poured on or used as a dip. Using the same mixture for my ewes, I found them clip well, and had few ticks upon them at shearing time. In conclusion, I would remark that many experiments have been tried by English as well as Scotch farmers in crossing different breeds of sheep for procuring more wool, which ultimately resulted in favour of long-woolled sheep. As indicative of this, we read from Mr Lucock's statistics, showing the average of short-woolled sheep to be 3 lbs. 4 oz., and that of long-woolled 7 lbs. 10 oz., being fully double the weight in favour of long-woolled. But I am fully convinced that the great secret of obtaining most wool is not in the application of this or that dip, which no doubt is essential in eradicating the animal of parasites, and cleansing the skin of all eruptions; but in the case of a pure-bred flock or a judicious cross having been effected, a progressive and regularly maintained condition of the sheep during winter and spring months up to the shearing time is the true basis of growing and obtaining either the largest quantity or best quality of wool.

Mr Ainslie, Hillend, was of opinion that the flockmaster who seldom changed his sheep could do with a dip of far less stringent quality than the man who was prone to change. He thought Mr Wilson had made some very pertinent remarks as to the dips which were most valuable, and Mr Murray had likewise added considerably to their information on the subject. In regard to scab and foot-rot he was aware that recently there had been a very great deal of these diseases in boats, railway trucks, and even in the Edinburgh market. Indeed, if one continued buying sheep in Edinburgh, he could scarcely keep his place clean. In some instances this year he required to dip his sheep twice, and he had used a dip of tobacco paper and spirits of tar. It was a very strong dip, however, and several turkeys had died through eating on the grass. For feeding stock, Bigg's and Girdwood's he considered the most effectual dips. Wilson's, he had found, loosened the teeth of the animals, and he thought there was a good deal of arsenic in it.

A Member said, that until these arsenical dips were used, ewes without their teeth were hardly known.

Mr Murray said he used 1 lb. of arsenic to 53 pints of water, and he found there was nothing dangerous about it but in the name.

Mr Girdwood, Edinburgh, asked Mr Brown if he had tried the dip? to which he replied he had not; when Mr Girdwood expressed himself surprised he should so strongly condemn it. At same time, he must admit there had been more complaints of it than he liked, but it was a new thing—the first year of it, and he had no doubt that all difficulties could be got over. Mr Girdwood continued—A great many farmers had tried his dip, and it had almost uniformly given the greatest satisfaction. In this matter, he felt that it was the farmers' interests that he had to serve, it was not for his own benefit. So far as regards the quality of the dip, nothing would be wanting on his part to make it both efficacious and useful, as he was aware, from practical experience, that a great deal of wool was spoiled by dips used. They could not imagine how much wool came into his stores spoiled in this manner. If they used arsenic in their dips, they would not only hurt the skin, but to a great extent injure the wool. By all means let them apply a dip that would not hurt the animal or wool. Mr Girdwood then read a letter he had just received from an extensive stock-breeder regarding the efficacy of the dip sent out by him, in which the farmer said, "I am glad to say your dip had proved quite successful. I have carefully examined the hoggs, and do not find a live ked on them. I attribute the failure of the last dipping to the fact of the hoggs being only about half a minute instead of a whole minute in the bath." Mr Girdwood proceeded to say that failure often took place by the animal not being kept in the dip a whole minute; a half-minute would not do. He complimented Mr Wilson on the details he had given of his experience, and it was only by such experience that they could gather information as to what was best to be done. His whole aim was to put the best dip in the hands of the farmer, and he would be glad to take any suggestions that experience might give. The article he sent out would not only kill keds, but would cure scab,

although he did not expect the latter would be effected by a simple dipping in it. An oily dressing was far better than a watery one, and the expense would not afterwards be grudged. Mr M'Lagan of Pumpherston had gained 2s. 6d. a head on wool by using such a smear. Mr Girdwood concluded by earnestly recommending them to abstain from all arsenical poisons, and stating that tobacco juice stained the wool. It was not yet a year since they had begun the manufacture of their dip, and it was astonishing to know how many had used it.

Mr Brown afterwards explained that what led him to his remarks on the dip, was when present at a dipping he took some keds off the sheep after being removed from the bath, and they became quite lively.

Mr Girdwood objected to such sweeping remarks from such an experiment, as no farmer was going to gather the keds off his sheep after dipping; and remarked that his object was simply to make the dip strong enough, and not to add more of the active principle than was actually necessary; but with the assistance of such farmers as Mr Wilson, we would arrive at a perfect dip.

Mr Brown said, no doubt Mr Girdwood had endeavoured to shew what was considered to be the ground-work of a good dip, and that farmers should go hand and hand with him in obtaining a successful issue. This may be well for those farmers who wish to support Mr Girdwood in forwarding the end in view, and ultimately paying 10 or 15 per cent. over cost price. I maintain farmers should experiment for themselves, thereby knowing contents of solution applied, which could either be augmented or deteriorated the ensuing season if necessary. For instance, in any one season the stockholder could select twenty sheep; let them be divided into, say five lots; let a solution of arsenic and soft soap be applied to No. 1, spirit of tar and soft soap to No. 2, castor oil to No. 3, and Girdwood's Melossoon, or any other dips, to Nos. 4 and 5, and carefully to mark the results, which should be the basis for guidance in after years. The experience thus derived from using a solution, knowing it will give the desired effect, at prime cost will accrue a profit to the farmer instead of Mr Girdwood, part of which may be expended, if considered expedient, on artificial food for the animal, which will do more to encourage the natural and most essential yolk than the external application of artificial yolk.

The Chairman said he thought dipping was the best mode of dressing. Among the various dips which had been tried, Girdwood's was proving a very satisfactory one, and likely to become a favourite. It should at least get a fair trial. He had found that shepherds with a long flock before them frequently did not give the sheep a full minute in the dip. Bigg's was, he thought, falling off, and although M'Dougall's was good, he thought it injured the quality of the wool. He had no doubt they had all derived great benefit from the papers which had been read, and the discussion which had followed. The writers had evidently bestowed a great deal of labour on the subject.

Mr Ainslie proposed a vote of thanks to Mr Girdwood for the trouble he had taken in being present.

Mr Girdwood replied.

A vote of thanks to Mr Penman for presiding terminated the proceedings.

WHOLESOME AND UNWHOLESOME MEAT.

(*From the Lancet.*)

In the current number of a contemporary journal * may be found a lengthy but interesting report of the trials of some important "diseased meat cases," as they are called, which recently took place in our northern capital. Amongst the witnesses for the prosecution were Professor Gamgee and Dr Littlejohn, medical officer of health, whilst those for the defence included Dr Grainger Stewart, Pathologist to the Royal Infirmary, and Dr Alexander Wood. The evidence of some of these gentlemen opened a point of argument of such an important character that we feel called upon not to let the record of this trial escape the notice of our readers. The court was crowded to excess during the trials, which lasted three days, and the determination and acuteness of the cross-examining powers of one of the counsel for the defence attracted considerable notice. But they were all in vain: the charges were found to be proved, the carcases were confiscated, and a penalty only not inflicted because the cases were the first that had occurred under the new Act.

* *Edinburgh Veterinary Review*, December 1864.

WILLIAM ROBB, flesher, and PETER GARDINER, dairyman, were charged at the Burgh Court on the 5th and 9th of November with having in their slaughterhouses, on the 29th and 31st of October, the carcases, or parts of the carcases, of cows, unsound, unwholesome, and unfit for human food. These cows, it was asserted by the prosecution, had laboured under the epidemic form of pleuro-pneumonia now raging amongst cattle; the Inspector of Markets (Mr WILSON) adding that he thought two "of these animals had been brought to the slaughterhouse to save them the trouble of dying." It was likewise shown that, independent of the disease present in the chest, "the meat was dry and clammy" or "soft and flabby;" that "numbers of bruises existed on the surface" of the carcase; that "the midriff was decomposing;" that "the flesh had a dark appearance, and was inclining to wet," &c. On the part of the defence it was admitted that the animals had been slightly affected by, or were in the very early stage of pleuro-pneumonia, but it was maintained that in such condition and at such a period no deleterious influence was produced upon the flesh, and that it was consequently wholesome and fit to be employed as food. As may be supposed, there was abundant evidence, lay and professional, on both sides, to prove just opposite states of things. Professor GAMGEE asserted that the meat in question was unfit for human food, and, said he, "I would not like to eat it myself;" whilst Dr ALEXANDER WOOD maintained that there was nothing wrong in the condition of the flesh, and rejoined, "I will eat a beef-steak off that cow if I can get it." Professor GAMGEE asserted that there was evidence for strongly inclining to the belief that the use of the flesh of animals as food which had had pleuro-pneumonia gave rise to colic, diarrhœa, and carbuncular affections in man; and that inflammation of the skin and eyes was produced in the Edinburgh slaughterhouses from contact of the septic fluids of such animals with those structures in men. On the other hand, Dr ALEXANDER WOOD expressed the opinion that all such ideas were old women's fables, and said that "he would not be there as a witness were it not that he felt it would be the greatest calamity that could befall the poorer classes of the city if every carcase affected with pleuro-pneumonia were to be condemned. It would raise the price of meat so much that it would be unattainable by the lower classes, and then the diseases that were produced by the absence of butcher's meat would be found to prevail. It was very decidedly his opinion that it was much more likely to be injurious to the health of the poor than if the trade were to be allowed to go on in their own way." Whilst Dr LITTLEJOHN considered an animal afflicted to the slightest extent with pleuro-pneumonia as unfit for human food, Dr GRAINGER STEWART contended that in the early stage of the malady the flesh was not affected. Mr ROBB's cow, whose carcase was found by Professor GAMGEE to be "obviously that of a diseased animal," "soft and flabby," so satisfied Professor DICK that he was led to exclaim, "I am ready to eat a steak off it just now." "I fancy," said Mr DYMOCK, who was cross-examining, "you would not give your friends that steak." "Yes," replied Mr DICK, "and many of them would lick their lips after it. Many of those who make a work about it do not know what diseased beef really is." The old adage, *De gustibus non est disputandum*, will no doubt help us to explain some of the discrepancies of the professional and other evidence. What one will tolerate or even enjoy, another will instantly repudiate. For ourselves, we must confess, however, that we should prefer Professor GAMGEE and Dr LITTLEJOHN to cater for our mess, rather than Professor DICK and Dr STEWART. There is a strong feeling with us that "sticky steaks, inclining to wet," with "bluish fat" to them as trimmings, are not model steaks, nor steaks of which as jurors we could make "honourable mention." Moreover, we really are simple enough to avow the belief that these are just the steaks which might be supplied by pleuro-pneumonic cattle.

But, leaving the steak question, let us come to a point which we had mainly in view in referring to these trials. From the carcase of ROBB's cow, which "seemed to me, as far as I could judge, perfectly good," says Dr STEWART,—but which carcase, it will be remembered, to the Inspector of Markets, to Mr GAMGEE, and to Dr LITTLEJOHN at once appeared unwholesome and unfit for food,—"I had certain portions of the flesh cut out, and took them with me to the Infirmary to look at them more narrowly. I put portions of them under the microscope to see if there was any morbid appearance, and there was none. . . . . I dissected a piece of the pleura in three parts of the cow, and cut sections of the muscles, and examined them with the microscope, and there was nothing but the thickening of the pleura, probably the result of inflammatory action; and the muscular tissue was quite healthy. I saw nothing in the flesh of the cow to indicate any unsoundness, and it seemed to me quite

fit for human food. . . . . I cannot tell at what stage of the disease the flesh becomes affected, but if you show me the flesh, I will tell you whether it is normal or abnormal."

Again, as respects GARDINER'S cows (concerning which Dr LITTLEJOHN, the officer of health, observed: "For the last ten years I have examined almost every animal that has been condemned in Edinburgh; a single glance at one of Mr GARDINER'S animals would have shown that it had been extensively diseased,") the Pathologist to the Royal Infirmary remarked that "he had examined the carcases of the two cows in question, that he had used the microscope in his examinations, and that he considered the flesh was quite sound, wholesome, and marketable;" and "by the term wholesome, I mean tending to promote health."

Whatever may be Dr STEWART'S qualifications as a microscopist, it is clear to us that we should not like to trust him to buy our mutton. In this respect we would prefer rather giving him the "cold shoulder" than taking it from him. Further, we entirely disagree with such a doctrine as would teach that animal flesh which under microscopical examination does not betray evident structural change cannot be unwholesome; and such was the opinion of Professor GAMGEE and Dr LITTLEJOHN. The former stated in his cross-examination that "the microscope could not be of the least use in examining the muscles in cases of pleuro-pneumonia. Occasionally the flesh that looks most beautiful is bad, for the appearances are often very deceptive; therefore great caution is required in the inspection. Defective nutrition makes the muscle pallid and thin." The latter witness observed: "I am well acquainted with the pathological appearances in the human body, and without such experience as I have had during the last ten years, I would be perfectly helpless in giving an opinion regarding the cattle of Mr GARDINER. I did not consider it necessary to subject these animals to microscopic examination, as it would have been a mere case of scientific trifling." With these same cows of friend GARDINER, Dr WOOD was equally delighted. "There was no trace of any disease whatever having extended to the flesh. . . . . The only methods of examining tissues known to scientific men were by the eye and by the microscope. The microscope frequently reveals morbid conditions of tissues which the eye fails to observe. No scientific man would call it trifling to use the microscope to examine whether the flesh of animals was diseased. He had heard it called trifling by flippant people who are ignorant of the use of the microscope; but he had never heard a scientific man say so."

Dr ALEXANDER WOOD will probably admit, however, that the important question at issue here is, whether the flesh of an animal used as food may not be positively noxious to the consumer, whilst microscopic examination of its muscular tissue shows no departure from a normal structural state; and not whether the microscope may not often reveal structural changes imperceptible to the naked eye, and that by it, and by it alone, can be detected certain organic lesions which cannot be demonstrably exposed by any other method. To ridicule the general use of the microscope in examining supposed morbid tissues is one thing; and to maintain that tissues may be endowed with certain noxious molecular activities which the microscope cannot detect is another thing. We should be amongst the last to do the former, and amongst the first to do the latter. The microscope can do much, but not everything. It cannot show us any stable and essential structural differences between the pus-globules of gonorrhœa, chancre, small-pox, and ophthalmia; and yet with what different activities or vital forces are they endowed. Can it point out wherein lies the essential difference, structurally, between the poison of the cobra di capello and that of curari? In fine, does not the more advanced science of the day lead us to the belief that, speaking generally, every disease must necessarily have been one of function before it can have become one of structure?—that the influence of a vast number of poisons—*i.e.*, azotised substances in states of putrefactive alteration—upon the blood must be regarded as rather dynamical than material, consisting more in the *propagation of force* than in the introduction or substitution of components? Changes of structure may be detected by the microscope; forces, except in the structural lesions they give rise to, never. True it is that such is the correlation of force and matter that alterations of the one would appear necessarily to involve modifications of the other. But may not a particular vital force be stored up in a structure in a state of tension as it were, and to which no transparency of vision can ever penetrate? Be this as it may, we refuse to accede to the doctrine that flesh-meat cannot be unwholesome because the microscope fails to detect any abnormal structural state of the muscular tissue.

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AND

Stockowners' Journal.

ORIGINAL COMMUNICATIONS AND CASES.

Remarks on Pleuro-Pneumonia Epizootica, and its Relations to the State of the Foreign Cattle Trade. 1864. By WILLIAM ROBERTSON, Member of the Scottish Board of Examiners of the Royal College of Veterinary Surgeons, Kelso.

WHAT is intended in the subjoined remarks is not something new regarding pleuro-pneumonia, either in its nature, development, or *post-mortem* lesions; with these we are all already conversant. And I rather fear, however humiliating may be the confession, that this advancement in our knowledge of its nature has not been productive of a corresponding advancement in the success of our curative treatment. I am free to confess that a larger percentage of animals recover than in the earlier days of its appearance; but whether this is the direct result of a more rational therapeutic treatment or the mere sequel of our more active interference being kept in abeyance, or that the disease has in itself become altered in type, I will not stay to inquire. Rather would I allow what I have to say to be taken as so much in proof of the truth of two points in connexion with the disease, and these probably the most important because the most practical, and of which the longer I am acquainted with it the more I am convinced of their verity. First, that pleuro-pneumonia is a highly contagious epizootic. Second, that we could, by many means, in a few years reduce this affection to the minimum both of extent and virulence, could we deliver ourselves from periodic fresh importations of the malady from those countries where it seems ever to be in ascendancy. Of the truth of these assertions we in the border counties have had additional proof, if this were needed, in the prevalence of the epizootic and condition of the foreign cattle trade during the year which has now closed. These counties are more properly feeding than breeding districts—as regards cattle—and thus we are ever necessitated to have additions to our existing stock; much more frequently than others differently circumstanced. It is during the autumn that these additions are mostly made, preparatory to the animals being put on winter keep; and it is at this season also that we have our regular

visits of lung disease, or, if already existing, the area of its existence is much widened. There are two dates in the history of pleuro-pneumonia during the last twelve years in these districts, at which it was much more prevalent than it had been for years before, and when the cause of this increase was easily and clearly traceable to the presence of an extra number of diseased foreign cattle. Those periods were, first, during the latter part of 1848 and beginning of 1849; and, second, during the autumn and winter of 1864. It was at the former of these dates that I first met with foreign cattle in numbers. They were at that time, as also last season, apparently from the Low Countries, mostly queys, and of the same colour (white and black.) They would certainly have paid the feeder well if they had kept free from disease. Previous to their appearance the district was very free from the epizootic. Shortly following their location we had a most violent outbreak of the disease, which, beginning with the foreign stock, spread to the home-bred animals, and was in both cases very fatal. I shall only detail two individual outbreaks of the disease at this period, as showing the manner of its propagation, and indicating slightly the loss sustained.

In September 1858, Mr A—— purchased somewhere about a score of foreigners, average specimens of their class. There had been no pleuro-pneumonia about his farm for years, nor any that I was aware of in those adjoining. His cattle were all in good health when the Dutch ones were taken home. For three weeks all went well: at this stage one animal was taken ill, and after four days succumbed. Post-mortem examination revealed hepatization of one lung, with extensive adhesions and fluid in the thorax; that same week two more were seized and terminated as the first. This state of matters continued for a month, during which time there were eight deaths from this lot of cattle. At this period the remainder were disposed of .No treatment had been adopted in any case: I had been simply asked to give an opinion as to the nature of the disease. From fourteen days to three weeks from the outbreak of the malady amongst the imported cattle, the first case of pleuro-pneumonia declared itself amongst the milch cows in the place. There had been free and uninterrupted contact with the former, ever since their arrival, being with them daily at the water and in the strawyard; the cow byre is also in close proximity to the curtain where the foreign stock was housed. *February* 1859, the disease still continued amongst the stock. All the cows were affected, and either died or were sold for fear they should die. Pleuro-pneumonia has not, during this period, been in any of the immediately adjoining farms.

Case second. Mr B—— obtains eight foreign cattle. He has never had lung disease amongst his stock, which are at present healthy. After being on the farm for a few weeks, pleuro-pneumonia shows itself, three of this number die, and the malady seems arrested. Contrary to my advice, the remaining five are brought to the homestead and placed amongst a lot of store cattle: these were imperfectly *separated from* an adjoining lot of fat cattle. Fourteen days after

being brought here the first case of pleura shows itself amongst the latter. From that time to midsummer 1859, cases of the disease were repeatedly showing themselves in both store and fat cattle.

No pleuro-pneumonia occurred at the immediately adjoining farms.

Very much similar in all details to its predecessor has been the visit of the epizootic of 1864. During the early part of the summer, and for some time previously, there had been little pleuro-pneumonia in the district. Not that we were entirely free from the disease, for where so many hold stock, some must of necessity be changing and importing fresh animals, the liability of which to be diseased is much greater than when home-bred.

About midsummer, the first of a large influx of foreign cattle, similar to those mentioned as appearing in numbers in 1848, began in our markets. From what I had seen on former occasions, I anticipated a fresh outbreak of pleuro-pneumonia amongst, at least, the new importations, and was not disappointed. Of the very numerous lots disposed of, I do not think there was one which has proved free from the disease; although one dealer, in his seeming confidence of their soundness, gave many a guarantee of their immunity from the disease for six months. Many who invested in these animals lost severely. Most, if not all, were first affected with the foot and mouth disease, and some were a considerable time ere pleuro-pneumonia showed itself amongst them. There is one point worthy of remark in reference to this last outbreak, which is, that it has not extended in the same degree as its predecessors to other stock than those with which it originated: this I believe may be accounted for by knowing that greater care had been taken than formerly to keep the foreign stock separate from the home-bred. Still, even when confined to the stock purchased, the loss has been considerable, the deaths in many cases amounting to one-fourth, at which point the remainder were removed—to where and with what result I am not able to state. This stock I believe were this season mostly landed at the port of London, and forwarded to our Border markets by rail; but the evil does not stop with contaminated railway carriages; the damage is indefinitely extended over the district from the travelling along and resting upon our country roads, to accommodate our local fairs and weekly markets. The fences separating our fields from the parish and turnpike roads are seldom or never sufficient to prevent animals leisurely passing along the latter having direct contact with such stock as may be pastured in the fields adjoining. Now I am not of the opinion that our breeders or feeders of stock are indifferent to the consideration of this scourge. I rather suspect, could they be canvassed, there would be few dissenting voices to the assertion, that of all affections incident to cattle, pleuro-pneumonia is the one they have most to dread. To be indifferent to its consideration is to be indifferent to their own interests. More meat and more manure is certainly the cry which is heard loudest from the ablest of our agriculturists—those whose eyes are open to the requirements of the day. The production

of grain is, and has been for some time, a matter of secondary importance. The most approved methods whereby the greatest amount of beef and mutton may be produced from a given number of acres, have by far the best chance of gaining a hearing from our British farmers. In truth, we seem but to be in the infancy of our knowledge and appliances in much that concerns the feeding of animals. I have ever thought that it is an extremely hard condition that the man who is so smartly treated, if attempting to dispose of his ox, which has become a victim of pleuro-pneumonia, should receive so little assistance from that same law which punishes, in the protection of his stock from the influence of disease. More, that it is decidedly unfair to permit the dissemination of diseased cattle over the entire country, and then punish those who, from no fault or mismanagement of their own, are endeavouring to make the most of a misfortune. I do not put this forward as a plea for the traffic in diseased animal food, but merely state the case as it may be viewed by any one from an unprejudiced point of view. Nor can I understand, on the other hand, how our stockowners have been so apt to fancy that those who have approached this subject with a view to a calm investigation of its causes and remedy were so many bitter foes leagued against their interests. No doubt, in the consideration of this question there are many difficulties; but why should these be deemed insurmountable? An inspection of imported cattle, it is understood, does exist; but it is evidently worthless for the accomplishment of the end in view. Nor will any mere inspection ever succeed much better. The most that any inspection, without some quarantine, can accomplish is the detection and detention of the actually diseased; but in how many instances are animals passed as sound in which the disease is latent, not to be developed in obvious symptoms for many weeks, and under favourable circumstances? Doubtless, many will say, we may as well prohibit the importation of foreign cattle as establish a quarantine sufficient to guard against the contamination of pleuro-pneumonia. I doubt it; but if it should be so, rather let us have no importation of live stock than have the periodic outbreaks of this direful scourge, as we have already experienced them. For there are considerable doubts if we do not lose more stock from this one disease alone than all the animals we import. And while remarking on this, I have much thought upon the value of statistics bearing on the point at issue; for I am sure, if their collection were instituted in a proper manner, and by some body in whom the stockowners of this country have confidence, the desired information would be most readily given.

Much has been said on this subject of pleuro-pneumonia in all its bearings, I am aware; and much expressed, more strongly than wisely. Many deny its contagious nature entirely; and others there are who as completely exonerate those animals we have referred to from any share in its propagation. If my memory serves me correctly, I fancy that one gentleman, a large live stock-agent and extensive importer of *foreign cattle,* gave it as his experience, when examined before the

parliamentary committee lately, that he never had seen a case of pleuro-pneumonia amongst foreign cattle, referring, I believe, to the very Dutch animals we have noticed. How this can be I am at a loss to understand.

I cannot see how any amount of individual and associated exertion will ever perceptibly reduce the mortality in stock so long as the indiscriminate importation and distribution over the country of cattle afflicted with pleuro-pneumonia is allowed. It is from our legislature that we must look for any assistance worth being entertained; while it may not be far distant when even this question will be forced on the consideration of government, however unwillingly —forced on them, because in it is involved much of the solution of another, and more readily understood as important—How is our increasing population to find a suitable and pecuniarily reasonable supply of animal food?

Veterinary Records. By G. Armatage, V.S. to the Marchioness of Londonderry.

TUBERCULOSIS, ACCOMPANIED WITH EXTENSIVE CHRONIC DISEASE IN A COW.

A fine bred, attenuated-looking, short-horn cow, having been put to feed, and moderate progress made during the succeeding two months, on Sunday, 13th March, of the present year, was reported unwell.

Symptoms.—Pulse 105, small, weak, and compressible, felt only to advantage at the brachial artery.

Horns, ears, and extremities cold as clay; mouth hot, nose dry. There are indications of acute internal pain,—*e.g.*, head protruded, mouth open, tongue hanging loose, drivelling of a ropy saliva from the lower jaw; protruded, blood-shot eyes, and general wild appearance. A long groan is uttered, which terminates in a spasmodic inspiration, and hard, dry, painful, convulsive cough.

Considering it probable that a piece of turnip supplied to the animals had become lodged in the œsophagus, within the thorax, the probang was passed, which let off a small quantity of gas, and afforded temporary relief, symptoms, however, speedily being re-established.

The rumen was found to be moderately filled with food, and as felt in the flank, the contents, although stiff, were compressible, but no distention from gas had taken place, nor did pressure on the viscus induce pain.

The third stomach could not be felt even after prolonged and repeated examination, which dispelled the idea of its being impacted.

A further examination at this juncture was prevented by my having

an urgent call. I left the assistant to make up and administer the following:—

℞. Magnes. Sulp., ℥. x. vj.
Hydrarq. Chlor., ʒ. ji.
Ol. Crotonis, gutt. xxx.
Zingib pulv., ℥. ij.

To be given in warm ale, and succeeded in two hours by a dose of ammon. carb.

After the second dose, which followed the first at an interval of four hours, the pulse was reduced to 84, being fuller and stronger, with a slight diminution of all the other symptoms.

On auscultation, the lungs appeared pervious, but the action upon the contained air evidently depended upon some other causes than pressure from the rumen and its contents; each expiration being completed by a slow and careful process, accompanied by the peculiar groan of suffering, which rendered this mode of examination much more difficult to prosecute with exactness, and rarely possible except during an inspiration.

Percussion favoured the idea of adhesion, a heavy dull sound being emitted on the right side. On the succeeding morning, the 14th, the bowels, which had exhibited great irregularity in their functions, now gave indications of being under the influence of the medicines administered, copious streams of a dirty straw-coloured fluid coming away in rapid succession, without the least pain or tenesmus, but on the contrary, rather passively than otherwise. The pulse is 84, fuller and soft; less power, and a greater equalisation of temperature, and other symptoms as before. Throughout the day, after oft-repeated visits, up to the latest hour at night, no improvement of importance has taken place beyond what has been related.

She drinks but little, hay tea being allowed; and in the way of food, hay only would be consumed, and in quantities which I considered prudent to withhold, and allow only small portions of the best.

The stimulant medicine ordered to be continued every six hours.

15th.—No change; symptoms as before—no fermentation from the contents of the rumen. The continued fluid evacuations, which escape from the small intestines, induced me to form the opinion that the medicine administered was passing off without entering the first stomach.

How far I was correct in this supposition, will be apparent from one or two facts to be noticed.

The peculiar groan, and convulsive sob-like accompaniments, aroused an ardent curiosity within me, and I earnestly sought for a conclusive explanation. The chest was again searchingly explored, the sounds emitted from which were considerably interfered with by the expiratory groan, and inspiratory gasp as before.

Percussion revealed nothing more than previously over the thoracic regions; but when carried backwards on the left side on the superior arch of the ribs, symptoms of pain were manifest, which increased in

proportion to the amount of force used, and producing at each time the hard, dry, convulsive,—in fact purely diaphragmatic—cough, and its general accompaniments, the painful excitement, which took considerable time to subside.

In following the spine forwards, and the arches of the ribs on the right side, the effects of each blow would be strikingly apparent as far as the shoulders, particularly when the closed fist was used.

During a lengthened examination of my patient, and rigorous interrogation of the cow-man, I learned, as I thought, new facts. As the effects of percussion were mostly witnessed over the hepatic region, I considered it most probable the liver was involved in chronic disease, and the cough a result of nervous disturbance,—a conclusion which appeared to account for the greater effects of pressure from the rumen, which has not undergone any change in its general characters, nor of that state or appearance to justify the adoption of surgical means for the removal of its contents.

The animal had rapidly lost flesh; and as the hope of cure was far distant, she was looked upon more as an object about which some useful information was to be gleaned, than capable of affording much satisfaction from a line of treatment, the accuracy of which would be in a great measure questionable.

I therefore spent several hours in the byre during the day, eagerly watching the symptoms, my attention being particularly drawn to the action of the bowels.

I noticed, or thought I did, on entering the byre, that linseed and other matters pass which had only been administered the previous evening. Accordingly, to test the correctness of the supposition, necessary precautions were instituted, which resulted in collecting small quantities of hay which had scarcely experienced the effects of digestive action, together with linseed and unground carraway and aniseeds, given with the powders of ammonia, by the assistant only, as before observed, the day previous. I now also concluded some impediment existed at the entrance to the rumen; but remembered the ease with which the probang passed in the first instance. It was however again used, when pain was plainly observed to be produced, both on entering the organ as well as during its withdrawal, the bulb being plugged with froth, mucous, and masticated sour food, totally unlike any that had come away by the intestines.

The propriety of removing the contents of the rumen was again discussed in my mind, as much with a view of exploration, and confirmation of my opinion, as anything else, but overruled by reigning powers. Instead, a severe blister was applied over the arches of the ribs, and a dose of cathartic medicine given,—the base being sodii chloridum, followed by acid. hydrochlor. with extr. tarraxaci.

16*th*.—The blister has not acted so well as its composition, ol. lyttæ, c. ol. crotonis, suggested it should have done. The bowels have acted inordinately, and shortly after the drench being administered.

Thirst is excessive; the rumen evidently not affected in the least, and seeds given in the drench yesterday evening, coming away in the copious fluid evacuations.

The pulse rose to 130 by the 18th, and all symptoms increased in severity. Ammon. carb. was again resorted to, which speedily gave relief and brought down the pulse to 84, indicating great regularity, but having a peculiar vibration or rhythm succeeding each beat.

Greatest relief being afforded by this stimulant, it was continued every six hours; each day now showing the animal was gradually becoming rapidly nearer her end.

On the 24th, further treatment was discontinued, as the mouth and fauces shewed the effects of the ammonia, and considered to augment the sufferings of the animal.

Late on the night of the 25th or morning of the 26th, she died, evidently without a struggle.

During this protracted case the pulse never fell below 84, nor assumed any greater tone or volume than at first; and the respiration was never hurried, although symptoms of oppression were evident. The temperature of the body and extremities, if stimulants were not persisted in, would rapidly fall, and become intense.

The animal would lie down occasionally, but not for any great length of time, the act of changing her position being attended with great pain, the convulsive cough and groan being produced in all their painful severity, which lasted some time, particularly at the close of the case.

The bowels continued throughout to pass a thin fluid, in which from time to time were found the various articles given but shortly previous to that: as matters thus progressed, and various conditions accurately noted, the conviction that some extensive disease was going on within became stronger,—the precise nature of which, however, from symptoms ambiguous in their character, or otherwise modified by co-existent circumstances, I could not determine.

On the 26th, an examination of the body was made.

Externally the animal has wasted much; the parotid and contiguous glands, which have increased in size within the past forty-eight hours, becoming painful to the touch, are now very plainly visible.

Internally much adipose tissue is present, particularly on the rumen and intestines.

The former viscus was not over-distended, and contained a fair quantity of masticated hay and ground corn. The latter had been supplied up to her illness; the whole of which was rolled together in one complete mass, firmly adherent by means of the secretions of the stomach.

The spleen was but little altered in structure; one-half, however, was attached to the rumen by adventitious membranes.

The liver was found to be in a most extreme state of disorganisa-

tion, scarcely a particle of its natural structure being recognisable: in parts, of a grayish-red colour, condensed, or otherwise congested, and its tissue in a state bordering on gangrene.

It was considerably altered in shape, and firmly adherent to the diaphragm by a mass of tubercular deposit in the form of a multitude of knotty enlargements. The gall bladder was dilated, and contained about a pint of dark green fluid.

When the liver was removed, it weighed 33lbs.

The lungs were attached to the right side of the chest, bottom, whole course of the spine, and diaphragm by a similar adventitious product to that found between the liver and diaphragm, which also lay in very large quantities around the trachea, within the thorax, bronchia, œsophagus, down to the stomach and base of the heart. The substance of the lungs was pervious, but emphysematous, darker in colour than natural, and mottled. Between the lobes lay a large pillar of tubercular matter, extending their whole length.

The heart was larger than natural, ventricles dilated, and atrophied in their walls; each cavity and the arteries for some distance being filled with a clot of coagulated blood.

The thoracic viscera, with the diaphragm, from which they could not be fully dissected, weighed 75 pounds.

Tracing the course of disease along the spine from the liver posteriorly, it was found to involve the crus of the diaphragm, and connected with a large ovoid tumour, weighing 5lbs., embedded in fat, anteriorly to the right kidney, and contiguous to the liver and æsophagean canal.

This body was enclosed in a covering of peritoneum; blood vessels were seen to enter, and when cut, it was found to be composed of cells filled with blood, undergoing changes, some containing a yellow matter not unlike pus, others a stiff, deep yellow, pasty substance of a cheesy consistence.

The right kidney was double its natural size, emphysematous, disorganised, and contained froth only; in fact it resembled cellular tissue more than any other thing, and weighed 3lbs. and half an ounce. Left kidney of great size, but apparently healthy, weighed 5lbs. and half an ounce. Tumours, varying in size from a horsebean to that of a cricket ball, occupied the course of the œsophagus to the rumen, containing a deep ochre-coloured matter, of a cheesy consistence, with calcareous admixtures.

The cuticular coat of the rumen peeled off easily. The contents of the second, third, and fourth stomachs were mostly fluid, and contained linseed and aromatic seeds given during her illness. The maxillary, sublingual, and parotid glands contained the same cheesy-looking matter, which was found in other parts described, in large quantities, the principal structure being absent in greater part.

Remarks.—I have purposely given in minute detail the particulars of this highly interesting case: and little remains for me to add by way of comment.

The general appearance of the animal from the first convinced me that her constitution was not of the most perfect; and my opinions were freely expressed as to her being decidedly of a scrofulous nature.

Formerly she was owned by a person who carried on a dairy of nineteen or twenty cows in the city of Durham, and about two years ago was purchased at a sale of the whole, when the establishment was broken up, by a small farmer in our neighbourhood, and the animal was still used for milking purposes.

She is said to have been in very fair condition when purchased, and continued so for two years, up to the time of her removal to our feeding byre. Here she was supplied with the best of food *ad libitum*, and appeared to make very great progress; but her high state of breeding, delicate form and organization, had doubtless suffered not a little from the extreme differences of treatment to which she had been subjected, first in the city dairy, and afterwards in the poor farmer's byre,—states as widely different from each other as it is possible to imagine, added to which the high stimulating diet and heated atmosphere of a feeding place in which twenty-four others were tied up, and proper principles of ventilation not thoroughly carried out.

The contents of the rumen after death clearly showed that no additions had been made to them since the commencement of her illness; as, notwithstanding that extreme doses of purgative medicine had been given, and large quantities of fluid had passed through the gullet, with admixtures which could not be mistaken, not a particle could be found in that organ; nor had the contents been in the least degree moistened by any fluids given. The only conclusion which I can give for this unnatural condition is, that the tumour,—which measured about seven inches in its long, and four and a-half in the short axis, imbedded in a large mass of fat anterior to the right kidney —had interfered with the passage of food or medicines to the rumen by direct pressure; for, in turning over the viscus before removal, that portion of the stomach where the œsophagus enters, came into direct apposition with the mass of fat in which the tumour and emphysematous kidney were found.

Probably, also, the diseased condition of the outer part of the œsophagus, extending to the canal and pillars, would also minister to a great extent to the occurrence by an effect upon the muscular fibres, as well as the condition of the organ itself under the influence of the contents.

VENTRAL HERNIA IN A FOAL. By the Same.

I WAS called on the 8th of September 1856, about 6 A.M., to see a foal about four months old, which had been injured in its endeavours to jump a wall, across which it was firmly arrested, and found in that position.

The young creature stands with an anxious expression of countenance. There is occasional internal pain, with a desire to stand stretching and putting the hind legs widely apart; respiration accelerated slightly, penis considerably elongated, and hanging near the ground; the glands being partially protruded from a side opening, but evidently not under such pressure as to cause inconvenience. In a short time urination was effected without difficulty.

The tumified parts hang within a few inches of the ground, but are not hot or tender; when pressure is applied no diminution takes place, and resembles a bladder moderately distended with air.

The animal was cast by means of two halters placed on his back, and during a struggle the tumour disappeared entirely; but all endeavours to find the opening through which the intestines had protruded were fruitless. I endeavoured to pass my hand up the rectum, but failed from the size—my patient being about ten hands high,—to obtain any actual information as to the situation of the rupture. He was allowed to rise, when it returned in a short time, *but not so large as before.* A dose of cathartic medicine was given, and after failing to adjust a temporary pad to prevent the reappearance of the hernia, left to procure one specially, if possible, adapted to the purpose.

Next day I had him again cast, with the same result as before, —bowels have acted well, and the animal looks himself.

Still being unable to detect the real seat of rupture, the pad which had been constructed could not be made of service. When my patient was cast the tumour disappeared; but when allowed to rise with the apparatus adjusted, I was again disheartened to see the tumour *slowly* develop itself, but not quite so largely as before.

The creature being very passive from frequent previous handling, he would allow the owner and his son to place him on his side, or lift him up, without struggling, which materially facilitated the examinations and endeavours to adjust the pad, with a view of producing pressure to the opening.

At this time I had the assistance of a professional friend and college companion, who, like myself, was compelled to arrive only at a conjecture as to the probable situation of the orifice. The hind legs were raised by litter, tumour reduced and pressure once more applied; and all appeared to go tolerably well until the 20th, when, after exhibiting signs of abdominal pain—for some hours, for which homely and other remedies at hand were applied without affording relief—I was again called in sufficient time to witness the act of vomition, which shortly preceded death. An examination of the body took place next day at noon.

After the skin was removed, the sheath of the penis was slit open and penis turned backwards. That portion nearest the abdomen, which had been forced downwards with the intestines, to which it had formed the sac, was found to be very loosely attached to the faschia above, and an interposition of effused lymph and changes bordering on gangrene, having proceeded to some extent.

About midway from the extremity of the sheath anteriorly, to the pelvis posteriorly, was a longitudinal slit in the linea alba, which was partly closed by the products of inflammation.

On opening this orifice with the scalpel, the same signs of disease extended along obliquely towards the left flank, for the space of several inches, terminating in a second opening in the oblique muscles of the abdomen and faschia transversalis.

A knuckle of intestine occupied this orifice, to which it had become united in the process of inflammation, from which the act of vomition had undoubtedly arisen.

In looking at the size of each orifice, it surprised me much that so large a tumour could have been developed, particularly when the intestines had to make such an indirect course. This also will account for the fact that it was irreducible when the animal was standing, and go far to explain why the openings could not be detected. The penis and sheath also, with the connecting cellular tissue which is met with in this part, and the rupture being indirect, or only through one portion of the parieties, while the other was left to act as a covering, were also obstacles to a complete diagnosis.

However complete an opinion might have been formed, when acted upon, there were grave impediments in the way of operating successfully.

If the first or outer wound beneath the penis had been detected and closed, still the internal wound, through muscles torn extensively and irregularly, yet not affording a larger orifice than would admit a couple of fingers, would offer such obstacles, that if even the after descent of the intestines were provided against, peritonitis, and union of the various parts by the resulting inflammation, would probably have resulted. In fact, the internal wound was attended with extensive laceration of muscular fibre and destruction of vitality in the parts, sloughing having commenced.

The pulses, as would be expected, during the life of the patient, continued at a great height; but otherwise, little could be observed that was wrong, until the day before death, when the appetite was completely gone; symptoms, however, throughout, not being of that urgent character that the nature of the injury would have led one to believe.

VENTRAL HERNIA IN A DOG: OPERATION AND CURE. By the Same.

SHORTLY after the foregoing case had come under my notice, a young dog, of the mastiff breed, was brought to me, with a large, soft, elastic, reducible tumour in the right hypochondriacal region, extending under the skin of the thigh almost to the hock joint.

The animal was about nine or ten months old, and attained a tolerable size, with large limbs, and bid fair to become of great power,—in fact, already a good weight for the young man who carried him.

I was told he had been run over by a cab in the morning; since when he had been continually lying in a corner, or any place out of reach, coiled up very closely. His appetite was absent, and he was very feverish.

I had the jaws firmly secured by a coil of tape, and the animal held lying on a table: the head and fore limbs by one assistant, the hind legs by another. The sac formed by the skin only was then opened by a scalpel, and the incision afterwards carried, with greater freedom, a sufficient length to enable the muscles beneath to be secured,—the rupture in which proved to be about four and a half inches long, in the direction from the stifle joint to the symphgsis pubes, thus allowing a great quantity of the intestines to escape, which were held by the skin, as it was separated from the muscles of the thigh, forming a tumour larger than the closed fist.

As the animal was placed on his back, the intestines fell back within the abdomen; and when the sac was opened they were fully exposed to view.

The edges of the muscles were drawn together by strong thread sutures, deeply inserted, the end of which was left hanging from the external wound.

The skin was united by pins and the twisted suture.

Purgative medicine was administered, and an outward application provided, and the animal was carried away. Proper instructions were also furnished for the domestic treatment of my patient, with a request that he should be shown to me again in a day or two, if alive; for I must say I had many doubts as to the successful issue of this case. Previous to his departure, I had been informed this animal belonged to a butcher, but when, I could not remember; and after several days elapsed without again seeing him, reproached myself for extreme carelessness, feeling chagrined and disappointed. Weeks passed, and I then felt convinced that he was "no more." At length months, in the lapse of time, assured me such must be the case; and he was almost forgotten when, one day, more than a year following, turning from a shop window into which I had been looking, I heard a growl of dissatisfaction which proceeded from a large and ponderous dog, not unlike what I had pictured my young patient to become. I felt a desire to have him examined then and there; but his face presented a forbidding look. My next determination was to watch him to his home; for it could not be far distant,—the locality seemed to be his territory.

Ultimately the owner, who did not know me, observing my movements from his shop door, inquired, "*Do you know that there dog?*" I replied, I thought we had been previously acquainted, and detailed my belief that he had been under my care for rupture, which turned out to be the case.

We adjourned to the shop; and after being turned up, I could not find any other signs of the previous injury than a thickening in the situation of the external wound. The owner said he never took any notice of the dog after he was brought home; for, on hearing the

account from the young man of the operation, left it to his care, feeling convinced that he could not recover.

Being a great safeguard to the premises, he was now valued, and came under my notice for a skin affection on two occasions afterwards.

EXOMPHALUS, OR UMBILICAL HERNIA. By the Same.

A BAY filly, two years old, by "Orlando," out of "Clementina," the property of the (fifth) Earl of Jersey, Middleton Park, was the subject of the above affection; and my advice regarding the possibility of its removal was sought on August 7, 1858.

The tumour, which was of the size of a cricket ball, possessed all the characters of umbilical hernia, which, after reduction, exposed an orifice in the subjacent tissues capable of allowing the passage of the middle finger, and during the preceding two months, had evidently increased in size.

In a conversation with his Lordship, it was ultimately decided that, previous to any operation being instituted, which would necessitate the use of the hobbles,—a proceeding, I was informed, there was great reason to defer, if possible,—pressure should be tried. As the animal was intended for sale shortly, reduction by this means was to be preferred.

With this view, a pad of stout leather, heart-shaped, with a contact surface of chamois leather, was placed on the tumour, and secured in its position by flank strops to a kind of crupper,—all being brought to, and deriving their security from, a stout circingle in front.

This was worn for three months, when it was left off; and no reappearance of the tumour having taken place, the animal was sold, and I lost all traces of her.

Although pressure in this instance was productive of results quite satisfactory, I am of the opinion that reductions and permanent closure of the orifice which occasions these hernial tumours in young animals is much more effectively, and in less time, insured by the application of clams, enclosing a fold of skin,—pressure being exerted thereon by screws, so as to remove a portion, by destroying the vitality in the parts, and setting up adhesive inflammation beneath.

During the years of 1858, '59, and '60, I operated in this manner on some scores of colts and fillies, most of which were traced to be the progeny of a stallion similarly affected, used by a great many of the agriculturists of the locality; and I do not know of a single case in which the plan was not successful.

The clams I use are made of iron, about six or seven inches long, having a hole at each end, through which a screw works, to draw up the opposite half. The flat sides, which come together, are counterparts of each other,—*i.e.*, one is provided with a groove throughout its entire length, into which a piece of wire, riveted into the opposite half, accurately fits.

These being applied, the screws turned to draw them together, the parts soon exhibit signs of separation, and generally drop off in four or five days, leaving little to be seen, particularly when care is exercised to place them on in the direction of the linea alba.

An old cow-leech, who had a grudge against me for being successful in these cases, wagered with a farmer that he could operate more skilfully, and, of course, more successfully, by another method peculiarly his own. Accordingly, a colt which had been shown to me for the purpose of being operated upon was turned over to him, and cast by the rope. Two stout needles were inserted in a crucial manner through the tumour held in his left hand, and strong waxed cord firmly twisted and drawn round the skin above the needles, close to the abdomen. The colt was released, and declared to be neatly done by Mr Bloodstick, for which he received the substantial fee of ten shillings. In the evening I was called to see the colt, which was now affected with gripes (?) I could not convince the owner that the needles were at fault, but persisted in removing them. The animal died, notwithstanding, before morning, and the *post-mortem* appearance fully confirmed my accusations. The old man afterwards gathered courage to inquire if I would allow him to look at "them ere things," as he now considered them to be superior in safety to his needles. I, however, warned him not to be so sanguine as to the truth of that statement, as the intestines might be enclosed within their grasp as well as taken up by needles. A pair of these clams were forwarded to him shortly afterwards, but I never heard of his having had an opportunity of using them.

SUPERNUMERARY FORE-LEG IN A FOAL; OPERATION FOR REMOVAL.

By the Same.

THE subject of the present description was a fine colt of the cart breed, about four months old, which had been foaled with a *fifth foot and phalanges,* for the removal of which my advice was sought in the month of June 1861.

Description.—The adventitious member was situate upon the inner side of the near fore-leg, and possessed a well-formed hoof, ossa coronæ, os suffraginis, and rudimentary metacarpal bone, which branched from the larger and natural bone about two and a half or three inches above the fetlock joint; it was altogether less than the natural limb, and reached within two inches of the ground as the animal stood. Although the whole were perfectly mobile, principally by virtue of the joints of the major and minor pasterns, and secondarily, at its point of origin it was not under the control of muscular power,—states favourable for total removal, which was decided to be effected at the first opportunity. Succeeding this arrangement, however, I was unusually and persistingly engaged in a totally opposite direction with others, more urgent cases, which delayed the operation about four

weeks, when, meeting the owner, I learned that the extra foot, &c., was becoming troublesome, which hastened my visit for taking it off. By this time a change had come over the parts. As the young creature gambolled around the dam, irritation was set up by the tall rye-grass of the pasture, and contact with the opposite limbs; the hoof was now absent, and the coverings of the ossa coronæ and part of the os suffraginis were partially sloughed off, and the whole appeared to be exquisitely sensitive.

I had them removed to the stables, where the colt was secured, and led out upon the straw. He was then cast upon the near side by a couple of halters, and the three unaffected limbs firmly secured and held by an assistant. I next secured the affected limb by a stout halter, which was drawn round an iron bar driven into the litter several inches, both given to the charge of a second person, whilst a third son of Agricula took possession of the head.

A strong ligature was passed round the leg below the knee. An incision was then commenced through the skin at the inner and lower point of attachment, and carried upwards, terminating at the upper centre, forming one-half of an elliptic; a similar action being effected upon the opposite side, which completed, blood-vessels of importance were visible, and as many secured before division as possible. Further dissection to the point of origin of the small and rudimentary with larger and metacarpal bone, with the securing and elision of vessels, was continued, when a strong scalpel was selected for passing through the semi-osseous metacarpal at its origin, parallel with the larger one, in which I succeeded perfectly.

The common integument was now brought together, and secured by the twisted suture, and presented a most satisfactory appearance; when the animal was released, a laxative administered, turned into a loose building with the dam, where they were supplied with green food, and the parts regularly dressed with tinct. arnic. mont. dilut.

In a few days the sutures came away, the parts healed rapidly and successfully, and in twelve months afterwards scarcely any signs remained to indicate that an abnormal condition had ever existed.

Remarks.—In the January number of the *Veterinarian* for 1859, there is an account of a similar case by Professor Varnell, of the Royal Veterinary College, London, for which an operation was performed, with these differences, however—the adventitious member in his case was upon the off fore-foot, and it was divided at the pastern joint. Now I may be considered worthy of the verdict due to a tyro, or guilty of a breach of all scientific rules in the practice of surgery by my procedure; but as a proof of rectitude is only generally seen after the termination of affairs, I think I may arrogate to myself the policy in having divided the osseous attachment; otherwise I must have had considerable enlargement by the remaining portion; but in this instance no wound could progress with greater satisfaction, and the successful result after twelve months more demonstrative.

Fatty Deposit in a Four-Year-Old Ox. By ALEXANDER GILLESPIE, M.R.C.V.S., Wooler, Northumberland.

THE subject of this communication—a four-year-old ox—was bred by the Messrs Rutherford of Wooler, and was slaughtered by them at the age of four years. He was a very plain animal, having high hocks, high rump, a want of flesh behind the shoulder, flat ribs, and light quarters. After death a fatty deposit was found in the right hypogastric region enveloping the right kidney; this fatty mass was of a conical form, and extended from the brim of the pelvis over the three last false ribs. Its entire length was 3 feet 1 inch, and it pressed upon the diaphragm at every respiration. The circumference at its thickest part was 5 feet 3 inches, and its weight was 131 lbs. When cut into it was of a beautiful rich cream colour, and perfectly solid. The left kidney was much less than the right, the former weighing only three-quarters of a lb., while the latter weighed 3½ lbs., and was perfectly healthy, though situated in the centre of the deposit. The kidneys of an ox of that age and size generally weigh from 2 to 2½ lbs. each. The nett weight of the animal was 74 stones, but the four stomachs were much less than those of an ox slaughtered the week before, which only weighed 66 stones. I estimated them to be about one-third less, particularly the manyplies, which was very much flattened. I attributed the flattening to the pressure of the deposit, as it was situated on the same side. The other organs of the body were healthy, with the exception of the liver, the external surface of which, however, appeared healthy; but when it was cut into and the biliary ducts exposed, they were found to be surrounded by a calcareous deposit one-eighth of an inch in thickness.

ON THE MANAGEMENT OF HORSES.

UNDER the above title, we purpose producing a series of papers, to be given in successive monthly issues of the *Review*, in the course of this year.

The entire subject embraced by the phrase, "management of horses," as well as being most important in its bearings, is indefinite in its range. Horse-breeding, constituting, as it does, an important section of the question we contemplate discussing, having received much attention of late, (at least, by words,) we shall not make it bear the burden of all the errors to be noticed, nor yet omit the many very important relations in which a good system of breeding stands to all good management of horses. The many questions regarding the custody of horses, their perfect development, preservation, and restoration, in which the science of hygiene may be made to play a most important part, are those to which we purpose soliciting most

attention. The over-much discussion about blood and breeding of horses, of late so freely indulged in, seems to exhibit no true progress, the tendency being little, if in any way, to advance the general understanding of the matter; nor can we discover the fundamental rules or rallying points that have been established through the exchange of opinions and recent controversies on horse-breeding.

To go into the subject of the management of horses broadly and rationally is the task we have spontaneously set ourselves to perform; and while respecting, not to be biassed by, the many prejudices which are always present where discussions on horses go on, despite the incalculable amount of sound and scientific knowledge subsisting, though widely dispersed.

Theoretically, knowledge on the management of horses must repose on the same grounds as that relating to other domesticated animals, the sources of life and health being uniform. Practically, however, the details to be observed differ widely in kind and number, and yet the successful sheep-breeder and improver of cattle, is frequently found to be the most rational and successful horse-breeder and manager; the plain reason being that the same innate love for the subject predominates, experience—the result of inquiry and observation—being the means by which the intelligence is made to compass the wider field.

In the whole range of management of horses, the amount of knowledge required, having due regard to animate *versus* inanimate stock, stands second only to that required by man of his fellow-men; hence the compatibility of the position affirmed, that the knowledge of horses extant is surprisingly great for extent and kind, while more is urgently required.

The knowledge established by the experience of individual men on matters relating to horse management is to a great extent localised and limited in the sphere of its influence; and reflective observation will show the truth,—whether we observe men professionally bred to the art of ministering to the requirements of horses, breeders, dealers, or the large proprietors and consumers of horse-flesh,—in no one individual amongst these is there to be found more than a part of the required knowledge about horses, and that blended with more or less cumbersome error.

Another aspect, peculiar to our subject, may be referred to, viz.—that knowledge on the management of horses is only slowly and not consecutively progressive; experience gained in one generation is lost, or lies dormant, in the next. Self-wrought-out experience amongst men has been too boastingly pitted against rational knowledge and written precepts, hence one cause of its uncertainty and other faults. It has long been proverbial that horsemen are intolerant of new methods when reasoning has to be had recourse to for their acquisition; if, however, it be so, the attribute can only apply partially, because it must be obvious to our readers that amongst men in the higher ranks of all nations, from reigning princes downwards, the ablest and best are admirers of the horse—taking interest in his state,

much in proportion to the well-being of their respective countries. And it always appears to us that the same feature is traceable generally, so much so that in consultations we find the liberal-minded are always earnest inquirers into matters tending to elucidate cases and causes; whilst the "rule-of-thumb horsemen" only prefer to remain ignorant, which implies in the instances improvidence and cruelty, at least cruelty in a negative form.

From the prefatory remarks made, it may be inferred that we are no pretenders to, nor believers in, infallibility in horse management, neither do we deem it necessary to prove that bad management predominates everywhere over good, in order to form a pretext for going into the matter. Assuming it to be a fact that much irrational practice, involving loss and cruelty (and all animal suffering becomes cruelty, where, under the control of men, the means of avoidance are not sought out) prevails, there seems good reason why any one with honest intention, and something to suggest, should urge the adoption of such systems in the management of horses as would effect good results if generally applied.

That some horse proprietors have enjoyed a satisfactory success, from the course of management they pursued, in no way weakens our proposition, that there is much need for improvement. Without having recourse to that vague phrase, good luck, there are local influences, degrees of care, and applied common sense, which make the absence of system far from uniform in effects; especially so in the case contemplated, where the health and life of animals are at issue natural influences play great parts.

In whatever way one takes up for theme the cause of the horse and the interest of the owner, instead of being greeted as a worker for good, antagonism has to be encountered, more especially where radical changes are counselled, without compromise or masking the truth, which, to be effective, must be set forth without reserve.

The horse, rather than any description of horses, is the motto under which our subject may be best treated and most fully embodied; from such common standing-point divergence can be taken and details brought in.

The horse, the most delicate of all the higher species of quadrupeds, in the choice of food and for cleanly habits, co-exists with man, as his servant and companion, over the greater part of the known world; always faithful under duty, alike in the arts of peace, the pleasures of the chase, and the tumults of war.

Though in his unredeemed state, and in those countries where found nearest approaching to that state, the horse species is found of very different character in different countries; the animal, however, is brought more uniformly up to the required standard of perfection in those countries where the advance of civilisation and the state of agriculture have made greatest progress. How good horse management and good farming constitute mutually dependent branches of applied skill it will be the aim of the writer to show in the course to be *followed by succeeding* papers.

The Veterinary Review and Stockowners' Journal.

ON THE PROBABLE INTRODUCTION OF A NEW DISEASE IN MAN.

THE sewage question has been agitating the public mind, and a word of caution has been called forth from Dr Spencer Cobbold, whose researches on parasites entitle him to speak with authority on the subject of a pamphlet he has recently issued.* "In Egypt, and apparently throughout North-Eastern Africa generally, and likewise at the Cape, at Natal, and in the Mauritius, there exists a more or less constant and formidable endemic disease, the nature of which was first described by Drs Griesinger and Bilharz. The disorder, or 'helminthiasis' in question, is caused by a small parasite or entozoon, which infests the bloodvessels, delighting more especially to take up its abode in the veins connected with the liver and other abdominal viscera, and in these situations it gives rise to very painful symptoms, followed in the more advanced cases by excessive prostration and death. Minute details respecting the peculiar features of the disease itself it is here quite unnecessary for me to adduce, as those who desire further information on this score have already been informed where to look for it; but," says Dr Cobbold, "I cannot proceed without a passing comment on the extraordinary prevalence of the disease in Egypt, which may readily be realised by the fact, that out of 363 *post-mortem* examinations conducted by Dr Griesinger, these parasites were found in no less than 117 instances. It would therefore seem that nearly one-third of the entire population suffer from this parasitic malady."

The Egyptian parasite referred to is one of the forms of fluke—Distoma hæmatobium—of Bilharz; and whilst in its mature con-

* A National Sanitary Question. New Entozootic Malady: Observations on the probable introduction of this formidable disease, and on the almost inevitable increase of Parasitic Diseases in general, as a consequence of the proposed extensive Utilisation of Sewage. By T. Spencer Cobbold, M.D., F.R.S., F.L.S., &c.

dition it sucks the blood of men and monkeys, in its larval or immature state it is present in the bodies of mollusks, which would find ample scope for life in the waters interspersed on lands on which any large quantity of sewage might be discharged. The parasite has been imported into this country, but under circumstances which have interfered with its extensive propagation; and Dr Cobbold justly remarks, that every colonist returning from the Cape is liable to bring the parasitic treasure with him as a "guest," dwelling in his blood and feeding on his body. The usual course of the eggs of these parasites now is, however, into a cesspool, a common sewer, and the sea; whereas, if any one of the gigantic schemes now in vogue are adopted, these eggs will be scattered far and wide over thousands of acres of ground, and the larvæ will penetrate the bodies of land and water snails, and ultimately perfect their growth in the bodies of the British people. It is not consoling to learn from Dr Cobbold that "in a natural-history point of view, it would not be an altogether singular result if, twenty years hence, this parasitic malady should be as prevalent in this country as it is now known to be in particular sections of the African continent."

We do not wish to create unnecessary alarm, but a word of caution in time may save us from great disasters and from serious pestilence. If the sewage schemes are to flourish, why not adopt some means whereby to destroy the germs of parasites? This is no impossibility.

Dr Cobbold draws attention to the untold number of tapeworm eggs which would be distributed and preserved by the quantity of sewage to be utilised. He shows how human beings are tormented and killed by these eggs gaining access to our bodies, and very appositely asserts that scores are the instances which he could adduce, showing not only that parasitic affections are but little understood, but demonstrating also that they are constantly overlooked. If one person afflicted with tapeworm may infect a whole neighbourhood, proving dangerous to the life of his friends and neighbours, may we not, asks Dr Cobbold, but too reasonably conjecture that the wholesale distribution of tapeworm eggs (by the utilisation of sewage on a stupendous scale) will inevitably tend to spread abroad a class of diseases, some of which are severely formidable? The question is as grave and important as any which those who attend to the sanitary condition of the country have occasion to study. To introduce new diseases is to sap the resources of our favoured land. Their prevalence will cost far more than can possibly be gained by recklessly redeeming

that which some people, and only some, now consider waste; and we have great pleasure in doing all in our power to re-echo Dr Cobbold's wise and timely warning.

SUNDAY CATTLE TRAFFIC IN LONDON.

THE traffic in foreign stock has involved us in many difficulties. It has cost this country many millions sterling; and though we are now compelled to buy as much as we can from abroad, inasmuch as our home production has been largely curtailed by foreign diseases, those engaged in the trade need not be permitted unrestricted power to annoy and injure, when with a little care the evils of the traffic may be mitigated.

We have taken pains to obtain some information as to the practice complained of by Inspector Holloway, and which led twenty-one drovers to be summoned before Mr Partridge at the Thames Police Court on the 6th of January. Owing to the Islington cattle market being held on Monday, large quantities of foreign stock enter the port of London on Sunday. This is of course not worse than the gathering together of British stock from all quarters on the same day, but the want of proper accommodation at some of the wharves leads to far more noise and inconvenience in some parts of London than there is any proper occasion for. When vessels arrive laden with cattle there is an instant overcrowding, and the animals are thrust into any shed or yard, often jammed together in the most unmerciful manner. The veterinary surgeon then examines the stock, and is worried by the drovers and dealers to certify that the animals require to be removed for the sake of their health. Such certificates we have seen granted after the animals had been comfortably watered, and could have remained where they landed without detriment; but what was perhaps once granted as a favour to clear out stock, is now imperatively demanded by the dealers and others. The veterinary surgeon is made to sign a certificate which in many cases he must feel need not be granted, and vexed indeed are the drovers if there be any delay in the surgeon's arrival. We feel that the duties of professional inspectors of live stock at the port of London are very onerous, and often ill appreciated. They are made to do work which in reality had better be left undone, and they are prevented by circumstances too numerous to mention from carrying out all the provisions neces-

sary to preserve our live stock from foreign disease. Mr Partridge suggested the proper way out of the difficulties connected with the Sunday traffic, for which the twenty-one drovers were fined. The cattle should be landed all at one spot, where proper accommodation would be provided for them. We should go further. For the protection of the lieges and of British cattle we strongly recommend the erection of a special market and special slaughter-houses near to the place of landing, and the disposal and slaughter there of all animals entering the port of London. If this will not do, some means could be devised to convey the cattle by rail to Islington, and thus avoid the dangers and unnecessary noises and fears incidental to driving cattle through the narrow and crowded metropolitan thoroughfares.

CHAMBER OF AGRICULTURE AND SCOTTISH FARMERS' CLUB.

It has been often remarked that, with the wide dissemination of knowledge which has resulted from the facilities afforded to all to write and publish their views at little if any expense, there has been an increasing tendency to silence. There has been more reading and writing, and less talking. The acquisition of knowledge from personal intercourse has, perhaps, not been encouraged as much as it might have been. Any institution, therefore, which tends to foster a free interchange of opinions amongst men who can teach each other much in the course of casual conversation or systematic discussion, must be regarded as the best of antidotes for that dreaded poison—taciturnity. If those who have written best have often been bad practitioners, it is to be inferred that they have been good men spoiled for want of proper opportunities to learn from all sources; and the workers are certainly often those who are disposed to be silent, except when spurred into discussion, and rendered communicative by cross-examinations. To secure the thorough sifting of all scientific and practical questions, it is essential to elicit the views of persons of all kinds,—of every shade of opinion. Very able men are often modest and positively shy, and a vast amount of knowledge is to be gleaned from those who do not aspire to the honours of authorship.

In agriculture free and unfettered discussion is much needed, and this especially in the best-farmed regions of the world—the far-

famed Lothians. There have been many societies scattered throughout the kingdom which have developed a taste for free interchange of thought; but, strange to say, in Edinburgh, where mental culture is highly appreciated, the ablest farmers of Europe have been condemned to silence in a very effectual manner. With every possible respect for brief, respectful, and ducal sentences as to the wishes and wisdom of successive directorates, there has been a cold, formal, and meaningless intercommunication between landlord and tenant, between the farmers of east and west, north and south, which has almost banished from the capital of Scotland the idea of hearty and wholesome talking and reciprocal teaching. The agricultural mind must be developed. The great questions of the day are rudely, roughly, and ignorantly dealt with. There has been no rational consideration for the opinions of those whose investigations have led to the appreciation of dangers ahead—indeed of great evils existing. Interests appear to clash when contending parties do not understand each other, and it is this understanding which is so much desired, to homologate the discordant elements working now in apparent opposition to each other, but which in reality aim at the same great point—the good of the farmer and of the country at large.

We have, therefore, great cause to congratulate the well-meaning men who have established the Scottish Farmers' Club. It has started under the most favourable auspices. It has already assimilated materials at opposite poles, and promises to elaborate them into a uniform, homogeneous compound, flowing smoothly in a broad current, fertilising as it expands, and bestowing great bounties on all around. If we have one reason for bright hopes more than any other, it is in the first appointment made since the institution of the Club. Mr David Curror, the secretary elect, is a landowner, a farmer, a sterling, well-meaning, and prudent man. A combination of such qualities renders such a person well fitted to reconcile differences and encourage friendships in an association established for the common good. Autocratic rule or guidance would not have been relished in a farmers' club. Leading by the nose may be good for bulls, but it is certainly enervating and stupid for agriculturists. They need no dragging or pushing, but the genial influence of free and social intercourse. The great want is genuine catholicity, and a proper respect for the opinions of others. The rough-shod system of the past has led to concussion, and we trust we shall now have more of the healing of wounds and bridging over of dangerous gaps than it has been our privilege to witness for a long time past.

THE TRUTH WILL COME OUT SOMETIMES.

A FORFARSHIRE farmer has made an instructive comparison between his books for 1864 and those of his father for 1834. The results of this comparison he has handed to an agricultural editor, and we have the following interesting, though not very common, confession :—

"When you pay 10d. or 11d. for a pound of steak, and read in the newspapers that prime Scots are worth 73s. to 75s. per cwt. in the Glasgow market, you very naturally conclude that the profits of the rearer and feeder must be exorbitant; but I am firmly convinced that more money was made by cattle-feeding when beef was 6s. 6d. and 7s. per stone than there is now at 10s. or 11s. If you rear your own stock, you pay two prices for your calves; and for one that died twenty years ago you now lose two or three. Not only is this the case with the calves, but at every subsequent period of their lives cattle are much more subject to disease. In my father's time the diseases were few, the loss from death trifling, and the nearest blacksmith our only doctor. Now, what with pleuro-pneumonia, the grass disease, and the foot-and-mouth disease, &c., the veterinary-surgeon is almost in constant attendance, and his bills form no inconsiderable item in our expenses. It is a very fortunate year, indeed, in which no deaths occur on a farm of any size; and too often the stock is decimated by epidemics. I once lost all my cows except one—the worst in the lot; and £300 would not cover my loss by deaths since I began farming, to say nothing of deterioration in those which survived. In this way a large percentage of the price of our fat stock is swallowed up. On the other hand, if, instead of rearing, you purchase your stock either as one or two-year-olds, you now pay a price relatively fully as high as that of beef, and are still subject to loss from disease. Having less grass than formerly, I now buy in a few bullocks for feeding; and this autumn I paid £16, 10s. a-head for them. High as this price is, it would have been still higher had it not been for the large numbers of English and Irish cattle that have for some seasons appeared in our local markets. The purchase of these is attended with great risk, and several parties in our neighbourhood have got their stock tainted by them. The railway trucks get the blame of this, and probably not without reason. The expenses attending feeding are now much greater than formerly; and you cannot get the high prices before mentioned unless you use something more than turnips and straw. Only a few of our best cattle bring anything like the top prices quoted in the newspapers; and in the same report you will often find a difference of 2s. per stone between the two extremes. This on an ox of 40 or 50 stones amounts to £4 or £5, and the animal may have consumed nearly as much food as a high-priced one. If forced from want of keep or any other cause to send our stock to market before they will sell for *prime* fat, they leave little or nothing for keep. Last season I received £265 for cattle, but this includes the price of a cow which I had to replace. This is the largest sum I have ever drawn for them, for my turnip crop was good, and I used the damaged grain freely. But, after all, it leaves a balance of £60 against me on the expenses already enumerated, besides what was required for my personal and household expenses. You will not say that I am extravagant in either, but I know that I am going back in the world considerably more than £100 a year."

It is unfortunately only too true, that cattle disease is effectually keeping in check the production of the stock we so much require. Mr Robertson's paper, published in this number of the *Veterinary Review*, affords another indication of the great losses incurred by farmers since the reckless introduction of foreign diseases.

THE SCOTCH BOARD OF EXAMINERS OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

It is with infinite satisfaction that we announce the unanimous election of Professor Syme to the vacant seat in our Scottish Board. The most illustrious British surgeons have readily lent a helping hand in the examination of veterinary students since the earliest days of veterinary education in this country. The Bells, the Coopers, the Brodies, and many more have manifested a great interest in the progress of our profession. The veterinary diplomas of the whole of the present century have affixed to them the brightest names in the history of medicine, and none will tend more to extend the influence of our northern examining board than that of the greatest of European surgeons. There is ample room for congratulation as to the progress made during the past few years. Prior to 1858, the Royal College enrolled few members in Edinburgh. There is now a prospect of the numbers in the north equalling those of London, notwithstanding the opposition on the part of one of the schools; and we doubt not that students will soon learn how useless it is to trust to any qualification but the one that is alone genuine, and granted under proper authority.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF COUNCIL, HELD JANUARY 17, 1865.

Present—The President, Professors Spooner and Gamgee, Messrs Broad, Cartledge, Dickens, Ernes, Greaves, Harpley, Harrison, Helmore, Lawson, Mavor, Moon, Robinson, Secker, Silvester, Wilkinson, and the Secretary.

The President in the Chair.

The minutes of the preceding meeting were read and confirmed.

Among the correspondence, which occupied the attention of the Council for some considerable time, was a letter received from Mrs Gabriel, in which she begged to thank the Council for their kindness in making the usual allowance to her late husband.

It was moved by Professor Spooner, and seconded by Mr Ernes—

"That, owing to the death of the late Secretary, the *balance of the allowance* made to him be now paid in full to the widow."—Carried.

A copy of the letter of condolence to the widow of the late Mr Ellis was read, together with her son's reply, thanking the Council *for their sympathy in her great* bereavement.

The Secretary next read copies of letters which he had addressed to the editors of the *Hereford Times*, *Bell's Life*, and *Sporting Gazette*, informing them "that a Mr W. L. Williams, of Hereford, and a Mr J. C. Pickering, of Gainsborough, who had styled themselves 'Veterinary Surgeons,' were not members of the Royal College of Veterinary Surgeons."

The Secretary laid upon the table a portrait of Professor SPOONER, in a handsome gilt frame, which had been presented to the Council by Messrs Harding & Co., artists and publishers, 16 Southampton Street, Strand, London.

It was moved by Mr SILVESTER, and seconded by Mr SECKER—

"That a letter of thanks be sent to Messrs Harding & Co. for their kindness."—Carried.

Two paintings from Central Africa were also laid upon the table, for presentation to the Museum, at the express desire of the late Mr E. N. Gabriel.

It was moved by Mr LAWSON, and seconded by Mr CARTLEDGE—

"That a vote of thanks be given to Mrs Gabriel for the same."—Carried.

The Registrar reported the following deaths, viz., Mr E. N. Gabriel, late Secretary of the Royal College of Veterinary Surgeons, whose diploma was dated July 3, 1822; Mr George Smith, Coxhoe, Durham, diploma dated 1862; Mr Harry Burt, Lewes, Sussex, diploma dated 1856; Mr Alexander Dunlop, Glasgow, diploma dated 1837; Mr Thomas Dickson, Durrisdeer, Dumfriesshire, diploma dated 1840; Mr Peter Campbell, Waltrie, Fife, diploma dated 1843; Mr Hope Hutchinson, Scone, Perth, diploma dated 1827; Mr John Hawthorne, Kettering, Northamptonshire, diploma dated 1817; and Mr Charles James Pyatt, of Nottingham, diploma dated April 30, 1863.

Mr Pyatt, whose death took place from an accident in the hunting field, Professor SPOONER referred to, as being a talented and promising young man, and the son of a distinguished member of the profession, to whom he proposed that a letter of condolence, expressive of the deep sympathy of the Council in his great bereavement, should be sent. This was seconded by Mr CARTLEDGE, and carried unanimously.

The Registrar also reported that 160 copies of the Register, with the Addendum and Revised List, had been issued gratuitously.

He next reported that three candidates, late pupils of the Royal Veterinary College, had been admitted members of the body corporate. Their names were also read, together with those of the Examiners and ex-officio members who were present.

A letter was read from Professor Morton, suggesting the propriety of placing before the students, at the examinations on Veterinary Materia Medica, samples of the drugs used at the Royal Veterinary College, to test their practical knowledge.

It was ordered, that the Secretary should write to Professor Morton, and inform him that the Council desired to leave the matter entirely *in his hands*.

The election of a member for the Scotch division of the Court of Examiners in the place of Professor Miller, deceased, was next proceeded with.

It was moved by Mr HARPLEY, and seconded by Mr ROBINSON—

"That Professor Syme, of Edinburgh, be elected to fill the vacancy caused by the death of Professor Miller."

On the ballot being taken, Professor Syme was declared to be unanimously elected.

The further considering the question of remuneration to Dr Struthers was also proceeded with, and the Secretary stated the duties which that gentleman had to perform to the Scotch division of the Court of Examiners.

It was then moved by Mr CARTLEDGE, and seconded by Mr LAWSON—

"That Dr Struthers be elected Secretary to the Scotch division of the Board of Examiners."

It was next moved by Mr SILVESTER, and seconded by Mr CARTLEDGE—

"That Dr Struthers be requested to receive the sum of £10, 10s., in addition to his examination fees."—Carried.

The House Committee, in their Report, recommended that a floor-cloth for the entrance hall, a cocoa-nut mat for the stairs, a new coal-scuttle for the Council-room, and some teacups, be purchased, and also that the doors of the Library, Museum, and Students' room be re-covered with baize; that the tables and chairs be repaired, and that the defective brick-work in front of the house be made good, and also that the walls of the back yard be repaired and coloured.

It was moved by Mr HELMORE, and seconded by Professor GAMGEE—

"That the Report be received and adopted."—Carried.

The Finance Committee reported that they had examined the vouchers and receipts of payments during the preceding quarter, and found them correct. The quarterly balance sheet of the Treasurer's account was read. The liabilities for the quarter ending 1st January, amounted to £119, 14s. 6d., including Messrs Garrard's bill for law expenses, which the Committee recommended should be discharged.

It was moved by Mr ERNES, and seconded by Mr BROAD—

"That the Report be received and adopted."—Carried.

Cheques were ordered to be drawn for the current expenses.

A letter from Mr Braby was then read, in which he expressed a wish to withdraw his motion for the present, in consequence of severe indisposition.

It was moved by Mr ERNES, and seconded by Mr WILKINSON—

"That Mr Braby's motion be postponed until the next quarterly meeting."—Carried.

By order of the Council,

WILLIAM HENRY COATES, *Secretary.*

THE LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE Lancashire Veterinary Medical Association held their ninth meeting, and first annual dinner, at the Brunswick Hotel, Piccadilly, Manchester, on the evening of the 11th ultimo, the president in the chair. Peter Taylor, Esq., president, Mr John Lawson, Mr Thomas Greaves, Mr Cuthbert Simpson, Mr Rodger Hampson, Mr James Haslam, Mr Wm. Haycock, Mr George Sermons, Mr Thomas Taylor, Mr Alexander Gibson; Mr J. S. Wilson, for the Federal army; Mr D. Maclean, army; Mr Challoner, Mr Alexander Lawson, Mr J. Howel, Mr G. Brown, Mr J. C. Taylor, Mr Heap, Preston; Mr Polding, Bury; Mr W. Whittle, Worsley; Mr John Greaves, Altringham; Mr J. P. Brookes, Pilkington; Mr Buckley, Blackburn; Mr Williams, Secretary to the Yorkshire Association; Mr Lord, Halifax; Mr Carter, Bradford; Mr Litt, Shrewsbury; Mr Cartwright, Whitchurch; Mr Lucas, President of the Liverpool Association; Mr Morgan, Secretary of the Liverpool Association; Mr Gilbert Heys; Mr Simpson, jun., Liverpool; Mr Friend, Liverpool; Mr Briscoe, Liverpool; Mr Bryden, Liverpool; Mr Wood, Ormskirk; Mr Robert M. Mann, surgeon; Mr Boyle; Mr Bleakley; Mr Harvey and others, were present.

THE INAUGURAL ADDRESS READ BEFORE THE LANCASHIRE VETERINARY MEDICAL ASSOCIATION ON ELECTION AS PRESIDENT, BY PETER TAYLOR, V.S.

GENTLEMEN,—By your kindness I appear before you as President of the Lancashire Veterinary Medical Association; and as it is a time-honoured custom to present an inaugural address upon election to any important office, I do so on the present occasion, in the hope that my humble aid may be a means of raising the standard of veterinary science, and show how necessary it is that veterinary medical associations should be so formed and conducted as to raise and elevate our minds in the pursuit of knowledge; and this can only be done when each member is determined to fulfil his allotted duty; for I do maintain, however high in the walk of science a man may be, more nobly, more faithfully is he fulfilling his mission to his Maker, and to his fellow-man, when he lends his presence and his abilities to endeavour to raise, to exalt, and elevate the thoughts and ideas of his fellow-man. At our last anniversary our esteemed ex-president was kind enough to read an interesting paper, giving an historical account of the veterinary surgeons who had practised the veterinary art in the city of Manchester. I will not repeat the kind, lucid, and good remarks he made of gentlemen who had, and are now, adding fame and honour to the science of veterinary medicine. I propose, by your kind indulgence, to review veterinary science up to the present time. The definition of "science," by Sir John F. W. Herschel, is the following:—"Science is the knowledge of many, orderly and methodically digested and arranged, so as to become attainable by one." Gentlemen, we are the living representatives of the veterinary science of the present day, and our knowledge has been gathered from those that have departed from this stage of life, matured and improved by our own observation, reasoning, and practical minds; therefore it behoves us to be on our guard and faithfully to perform our duty, as there is scarcely any well-informed person who, if he has but the will, has not the power to add something essential to the general stock of knowledge, if he will only observe regularly and carefully some particular class of facts, which may most excite his attention, or which his position may best enable him to study with effect. High, noble, and great the members of the Law, Divinity, and Medical

Science professionally are, and great are the honours and emoluments conferred on some of the most eminent. Not so with ours. Our profession, from its earliest history, is, and ever will be, much indebted to its sister profession—viz., Human Medicine. Hippocrates, the father of medicine, who lived 460 years before the birth of Christ, was the most celebrated physician of early times. He wrote a treatise on the curative treatment of horses, and practised indiscriminately on the horse and its rider. 300 years after the birth of Christ we have a veterinary Hippocrates of the name of Vegetius, who took upon himself to collect and record the knowledge of the previous veterinary authors. After this a long period of darkness succeeded these barbarous ages, and after a great lapse of time iron shoes, before but partially tried, became generally used, and the treatment of diseases of the horse was the province of the horse-shoer, and medical assistance to other animals was trusted to the shepherds and their attendants. The sixteenth century opened unto us a new field of learning and encouragement of the arts, and amongst the first patrons was Francis I., who ordered the Constantine collection to be translated from the original Greek into Latin, and afterwards into Italian, German, and French. From this time it became diffused throughout Europe. About this time Vegetius' works were translated into the popular European languages, and our art continued to progress up to the seventeenth century. At this period we have a treatise on horse-shoeing by an Italian, Cæsar Fiarchi; and advanced in this century we have handed down to us an elaborate work of great merit on veterinary medicine, by Solleysel, which was a great means of advancing the knowledge of the veterinary art. In the year 1761, France, with the acuteness and alacrity which distinguishes her even in our day, set the noble and good example at this period in establishing under royal patronage a public veterinary college at Lyons, having the celebrated Bourgelat for its professor. His medical and anatomical works were numerous and well known. Five years afterwards, which brings the time to 1766, a second college was opened at Alfort, near Paris, showing with what energy and industry the French nation advances a science, which was necessary and profitable for their country. Soon after this other colleges were opened at Vienna, Berlin, Copenhagen, Dresden, Leipsic, Prague, Munich, London, Hanover, Naples, Russia, &c., &c. As a contemporary with Bourgelat, the first professor of the veterinary college at Lyons, lived the elder La Fosse, a name that will ever be appreciated and respected for the great improvements and discoveries he made in veterinary medicine, which he communicated in the form of memoirs to the Royal Academy of Sciences at Paris. About this time works were published by the following eminent French veterinarians:—Chabert, Flandrin, Huzard, and others; a veterinary dictionary by Buchos; a treatise on peri-pneumonia in cattle and mange in horses, by Chabert; and a work on glanders by Chabert and Huzard. France has given us enlightened and scientific men since this period; we have Hurtsel, d'Arboval, Dupuy, and not the least is Girard, to whom the French colleges were indebted too for their text-book on the anatomy of the horse; and even at the present time we have the enlightened, scientific, and patriotic Professor Bouley at the Alfort College, who has published veterinary scientific works, and who receives English veterinary surgeons and students with that high, noble, and gentlemanly grace which deserves our warmest thanks and admiration. In the year 1788, Mr Charles Vial de St Bell, whose name will ever live in the memory of succeeding veterinary surgeons, by being the first professor of the veterinary college in England. He was professionally educated at Lyons Veterinary College, afterwards became junior assistant at Alfort; came over to England, and published proposals for forming a veterinary college in London; was disappointed, and returned to France. In the year 1790 he again visited England, and made a second attempt, and was supported by a Hampshire Agricultural Society, who were fully convinced of the advisability of such an institution, after a time; and in February 1791, the first organised meeting took place, at a coffee-house in Bond Street, London, and formed themselves into a society, and history will record that a high and influential nobleman condescended to undertake the office of president—viz., his Grace the Duke of Northumberland. Vice-presidents and directors were selected, and a house in St Pancras was taken. Pupils were admitted, and St Bell was skilfully assisted, as a translator and anatomical demonstrator, by the able services of Mr Delaberre Blaine. St Bell's works were an "Essay on the Geometrical Proportions of Eclipse," "Lectures on Farriering, Shoeing, and Diseases of the Feet."

In August 1793, St Bell's death took place, and there appears to have been some differences of opinion who was the most suitable person to succeed him. We have

the names of Mr Clarke, of Edinburgh; Mr Morecroft, and a Mr Coleman, a young surgeon. It appears that Mr Coleman and Mr Morecroft undertook the professorship conjointly, but very soon afterwards Mr Morecroft seceded, and Mr Coleman became the sole professor, and under whose able and scientific care the London Veterinary College will ever be indebted too. In his most successful reign we have a theatre opened for the delivery of lectures, a dissecting-room erected, a museum formed, and an infirmary added to the college, for the reception of patients. The pupils were examined by medical professors and practitioners, and received a diploma, if found qualified by having the necessary abilities. Professor Coleman was most generously and ably assisted in his good work by two of the greatest ornaments in the medical profession, viz., the illustrious John Hunter and the high and able Sir Astley Cooper. George the Third granted the rank of commissioned officers to such veterinary surgeons as might be appointed to regiments. Under these high and most noble encouragements, the college soon acquired additional teachers. Mr Sewell was appointed assistant-professor, and subsequently Mr Vines and Mr Morton became active and useful assistants. About this time the teaching and practice of the college became considerably extended, by attaching to the teaching of the horse, the anatomy, physiology, and pathology of the ox, the sheep, dog, and other animals.

We have now come down to the eighteenth century, which period was destined to witness a great advancement in veterinary science and art. We have works of numerous authors. Professor Coleman published works on "The Formation and Uses of the Natural Frog of the Horse;" on "The Structure, Economy, and Diseases of the Foot;" and "Observations on Wounds of Circumscribed Cavities." Mr Morecroft published a work on "The Various Methods of Shoeing Horses," with incidental observations. Mr John Lawrence published a collection of extracts from St Bell, Osmer, Clarke, and Lord Pembroke, 1801. Mr White, a veterinary surgeon of Exeter, produced a "Vade-mecum of Farriery." At this time a work of great merit and practical knowledge, on "The Paces and Proportions of the Horse," appeared, written by a very able and enlightened veterinary surgeon of Birmingham, Mr Richard Lawrence. We have a work on "The Diseases and Treatment of Cattle," by Mr Downing. In 1803 a "Veterinary Treatise," by Mr Feron, V.S., 13th Dragoons; and Mr Ryding's "Veterinary Pathology." In 1805 we have a "Veterinary Dictionary," by Thomas Boardman, V.S., 3d Dragoons; a "Treatise on Cattle," by John Lawrence; and a work by Francis Clater. In 1809 we have Mr Bracy Clarke's, of London, elaborate and enlightened works, viz., "Dissertation on the Foot of the Horse, with Experiments on Shoeing;" a "History of the Bots of Horses," which has established a reputation for its author, and which will hand down to posterity a name which will ever be spoken of as one of the great luminaries in veterinary science. In the year 1818 we have a Mr William Dick, who was destined to play an important part in the history of veterinary science. He received his anatomical knowledge and his professional education at the London Veterinary College, under the professorship of Edward Coleman. William Dick received his diploma in 1817, and returned to Scotland, and with his sagacious mind saw the necessity of opening another college, which he did in Clyde Street, Edinburgh, in the year 1818, under the auspices of the Highland and Agricultural Society of Scotland, and became Professor of Veterinary Science of Scotland; and there is no man who has elevated the character of a profession by dint of professional ability, in so short a time, and to so high a position, as he has done for veterinary science in Scotland, and has continued to perform the duties of professor to the college up to the present time, fulfilling the important and daily duties for the large space of forty-seven years. Where is the man who has done more to advance veterinary science, or to elevate the position of the veterinary surgeon? Who knows him, knows a man—a true type of Scotland's sons! He has a large, profound, and practical knowledge on all veterinary subjects; of unremitting perseverance and industry, and a determination not to be behind in the noble race, peculiar to the men and their country. Gentlemen, he has not that brilliant eloquence of an accomplished speaker, nor is he a fluent lecturer; but he has a tact, a property above all properties, of leading and directing a youthful mind up and through the steep, and rugged, and slippery paths of advancement to the summit of veterinary collegiate education, and shows him, by forcible truths, the sands and shoals he must avoid, which results in producing a qualified man, that goes forth and proclaims his alma mater and pater noster of veterinary medicine in the city of Edinburgh—living monuments, that honour the name of Professor Dick. His works are two manuals on veterinary science, and written much more in other periodicals, and was co-editor to the *Veterinarian* for a long time.

In 1823 we have another important explorer in veterinary science of the name of Mr William Percivall, a veterinary surgeon of the Royal Regiment of Artillery, afterwards to the 1st Life Guards. I cannot find language to do ample justice to one of the most brilliant veterinary ornaments that ever shone. It sent forth its brilliant and illuminating light to enlighten the ignorant, to refresh and improve the educated, and has shown, by eloquent and flowing language to those that represent, study, and pursue the science of veterinary medicine, that it is a high, noble, and benevolent calling. This year he published his veterinary lectures on "The Anatomy, Physiology, and Pathology of the Horse." In 1832 he published the first, and I think I can safely say, without fear of contradiction, the only work in English, even at the present day, on "The Anatomy of the Horse,"—a great and meritorious work at that time, illustrating what a determined and energetic labourer he was in the field of veterinary science. He afterwards published his beautiful and scientific work called "Hippopathology," and was for a number of years co-editor of the *Veterinarian*. Here, gentlemen, is a noble man that deserves our admiration and praise for his great talents, much more for the handsome and intellectual manner he has recorded them for the benefit of succeeding ages whose lot it will be to follow after. All this time our Royal Veterinary College, under the able and scientific care of Professor Coleman, sent forth every year a large number of educated, gentlemanly, and accomplished veterinary practitioners throughout England, Ireland, and Scotland. I will give you the great Sir Astley Cooper's opinion of Professor Coleman, given at a dinner presided over by him on January 23, 1833. In proposing Professor Coleman's health, he said—He had been acquainted with him forty-five years, and their friendship had never been broken or weakened. During that period he had published a "Treatise on Asphyxia," which did him infinite credit. He had been selected as successor to St Bell, for his anatomical knowledge and his physiological inquiries, and the accuracy of his deductions from the various experiments he had instituted. He had carried the same spirit of inquiry to the study of the horse, and veterinary pupils and veterinary science had been incalculably indebted to him. The profession might be said to be indebted to him, and to him alone, for the rank it held in public estimation; for it was the commission which he procured for regimental veterinary surgeons which proved their passport, and for many a long year the only one they could have, to the highest society in the country. It is the support of such men, and the advantages which their friendship secures, that raises the dignity and position of a college. Professor Coleman worked, lectured, and laboured for the cause of veterinary science for the long space of forty-six years. He died in July 1839, after a long, active, and most useful life, at the advanced age of 71.

We have a Mr William Sewell, who was apprenticed to Professor Coleman in the year 1796, received his professional education, and afterwards became his assistant; subsequently was appointed sub-professor, and lastly was appointed professor, on the death of Professor Coleman. Professor Sewell devoted fifty-seven years of his lifetime to the duties devolving upon him in these several capacities, and was professor for fourteen years. He was (I am indebted to the *Veterinarian*) not gifted with those high talents of a Coleman, but had an average share of talent, in conjunction with all the requisites of a plain, efficient man of business, who has left an example, after more than fifty years' devotion to the veterinary profession, of a perfect pattern to the rising generation;—an illustration of the success of industry, temperance, and frugality, when combined with integrity and honesty of purpose. Professor Sewell made the grand discovery of Neurotomy in the year 1818, and published and presented the paper to the Royal College of Veterinary Surgeons. In 1835 he introduced a novel operation, by dividing the periosteum for the relief of pain in exostosis, and became a great advocate for setons. He also, I believe, assumed to be the discoverer of the administration of sulphate of copper for the cure of glanders. Such, gentlemen, is a sketch of one who did his best, with his head and his heart, to advance our science, to which he was singly and ardently devoted. Another instance of a long, honourable, and useful life, when death removed him at the advanced age of 72 years. He died on the 8th of June 1853.

In 1853, we have Professor Spooner elected as his successor,—a person whose mental acquirements are in every respect well qualified to fulfil that high, honourable, and noble position. He is a fluent and eloquent lecturer, a profound anatomist, a good physiologist, and a good and clever pathologist. He has devoted his whole life, I may say, to veterinary college duties, and has been professor for the Royal College of Veterinary Surgeons for the space of twelve years, and continues to guard,

protect, and advance the interest of our alma mater with a maternal care even at the present time. He is skilfully, ably, and scientifically assisted by Professor Simonds, Professor Varnell, Professor Tuson, and Mr Pritchard.

Gentlemen, I should regret losing the present opportunity of paying a just tribute to the high and sterling merit of such great and enlightened men as the late Mr Delaberre Blaine, William Youatt, James and Thomas Turner, William Robinson, Mr Goodwin, John Barlow, Professor Stewart, Mr Karkeck, John and William Field, Mavor and Brothers, Thomas Morton, William Haycock, Professor Brown, Professor Gamgee, and Finlay Dunn; who have, by their transcendent talents and published veterinary works, and many more who have unostentatiously, but in a quiet and practical manner, assisted to raise the position of the veterinary science.

We have now arrived at our own time, and we have recently two new colleges opened in Scotland. Professor Gamgee has opened another in Edinburgh. I wish he had planted his vineyard in our sister isle (Ireland) in place of Edinburgh; it would, I am sure, have done more good, and advanced the interest of our science, and conferred greater benefit on mankind at large, and have yielded more abundant and wholesome fruit, rather than have the appearance of sapping the vital supplies of an established college which had existed for more than forty years. A fourth college is opened at Glasgow, with Professor M'Cull at its head.

Gentlemen, let us now take a survey of our science, and ask ourselves the following questions:—Firstly, Have we made great progress? Secondly, Are we higher in our social life? Thirdly, Is our calling so appreciated by our Legislature as it merits? Fourthly, Do our colleges treat us with that high regard as our position deserves? Fifthly, have our colleges made that onward progress they should have done?

First, Have we made great progress? Our ancestors bled, rebled, purged, blistered, setoned, &c., &c. Their impression was, there was an enemy within; they must reduce the city by taking away its vital supplies, and placing on a greater enemy without; they bled, purged, and blistered, in all diseases. Not so in our age. We rarely bleed, never purge (with aloes) in inflammatory diseases. We husband our vital energies to carry on the warfare to a successful result, and admit pure and wholesome air, and by careful observation we inquire whether the city demands extraneous aid, and find out the nature of supplies required. Look, again, to an open joint. They plastered and bandaged up the inflamed and injured joint. We relieve the active inflammation; afterwards we stop the discharge of synovia, by acting chemically upon the escaping fluid. We certainly do "counter-irritate," but not to that extent which they did. In fact, diseases are now treated more scientifically and much more successfully than formerly. We do not throw in bucketfuls of medicine, but we regulate our dose and repeat it, so as to have the desired effect in assisting nature's efforts. I think we have good reason to say we have made great progress.

Secondly, Are we higher in our social life? Formerly the farrier and veterinary surgeon was the companion of the coachman, groom, carter, and dairyman. Not so now. We treat them with becoming gentlemanly respect; we do our duty, and expect them to do the same. We are admitted upon social terms with our clients, and are by the majority greatly respected. Allow me to say that the elevation of our ocial position is in our keeping; we must protect ourselves by never shirking to fulfils our duties honestly and fearlessly, and always pride ourselves to be the gentleman. Associations like these are high steps in right directions. I say our social position is higher and more respectable.

Thirdly, Is our calling so appreciated by our legislators as it merits? On looking over our history, we do not find in it a lord, a baronet, or even a knight; but if any ingenious man should form a weapon which will be a means of destroying more men, at a given time, and at a greater distance than any in present use, he is honoured by knighthood. Our profession has many members, who have formed many scientific weapons, but they are used for preserving and protecting animal life. Our legislators cast us away, as a ship upon the open sea, without a rudder; we have no charter, and we are not even allowed the same privileges as our sister profession,—viz., the exemption upon juries, and protection to our science. I say they do not sufficiently appreciate our calling, or do justice to our profession.

Fourthly, Do our colleges treat us with that high regard as our position deserves? High and noble as they are, I think not. If any youth, even if he be a joiner, a mechanic, or a labourer, and had never seen a horse, "pays his fees," he would be admitted as a pupil to all the privileges of the college. This should not be so. First, he should pass an educational examination, which I am pleased to say that Professor

Spooner has recently made it a *sine qua non* at the London College. Secondly, he should be apprenticed under a practical veterinary surgeon for three or five years; on presentation of these certificates, be admitted to the college duties. By these means we should have a higher and a more enlightened veterinary surgeon.

Fifthly, Have our colleges made that onward progress they should have done? Thanks be to them, they have sent forth a large number of intelligent men to practise the veterinary art; but withal we have not a text-book on the anatomy of the horse, the ox, the sheep, or the dog. We have still to fall back upon Percivall's "Anatomy of the Horse" (which some of them discard) for the education of our youth. We are obliged to read and consult the medical works of physiology, and to consult our medical authors for much more information, which we ought to gather from our own professional resources. Gentlemen, our profession consists of two parts—first, its principles, upon which it is based, the knowledge of which is called science; secondly, of the art, means by which the knowledge is applied and carried into effect; and a judicious practitioner requires a combination of both, in conjunctiou with a clear head, a quick eye, a steady hand, and a good ear; but, gentlemen, to grasp the all-hidden wonders of the universe is beyond the power of our finite mind. I am sure you all know that a knowledge of our profession is only acquired by continued labour and application. Work is the beginning, the middle, and the end of our profession; therefore, gentlemen, let us work onwards, with firmness and resolution, to raise the standard of our profession still higher, and make the Lancashire Veterinary Medical Association the arena where we can all come and draw from the fountains of the practical, the intelligent, and well-stored minds, and invite our professional labourers to come into our field of science, to meet us as brethren, to lay open the results of their labours, to set forth their deductions at which they have arrived at, to ask for their examination, and to maintain, in the combat of debate, the truth of their position and the accuracy of their observation; for, gentlemen, we have yet boundless fields still before us for intellectual exercise and honourable distinction.

After dinner, various toasts were proposed and responded to. In responding to the toast of "Provincial Veterinary Medical Associations," Mr GREAVES made the following observations:—

MR PRESIDENT AND GENTLEMEN,—In rising to respond to the toast which you have been pleased to designate the toast of the evening, I beg to say I am fully aware there are numbers of gentlemen present who could respond to it much better than I am able to do; but there are none to whom I will yield in a desire to advance the true interests of my profession, or to promote the welfare of these associations. In the few remarks which I have to make I shall take a retrospect and an anticipation of Veterinary Medical Associations. During the year that it has been my high honour to preside over your association, we have increased in members from eleven to thirty-three or thirty-four; our funds, which were below zero, are now £30 to £40; we have held four quarterly meetings and ten or twelve special meetings; at our quarterly meetings we have been well supported by our professional brethren; we have been honoured by the President of the College, the President of the Yorkshire Association, and many other eminent practitioners. The success which has been attained is attributable in no small degree to the untiring exertion of our late secretary and treasurer, who have rendered all my duties a positive delight. I have thought that I was doing my profession a service by encouraging these associations. With that object in view, I have attended the Yorkshire, North of England, and the Liverpool Associations, also the banquet at Birmingham, and the annual meeting of our profession in London, and spoke at each of these places, commending as ably as I could the cause of these associations, and the remarks have been deemed worthy to be recorded in the pages of the *Veterinarian*. It is very becoming and proper that we should occasionally quit the arena of toil, and rejoice with those who rejoice. Let us weave a web of kindness, and warm each other by a mutual transfusion of kind feeling. The vexations, disappointments, and irritations common to our professional duties, which is the witnessing of one continual succession of suffering and death, demand occasional relaxation to enable us to discharge the obligation of life aright. On the last occasion the mover of the vote of thanks was pleased to say—"I had watched over these associations with a paternal care." I covet no higher honour. I felt my bosom swell with gratitude and pride as I listened to that statement. I feel proud of the honour done me in permitting me to respond to this toast. Let us aim high,

and make ourselves respected by the steady force of true principles. You will see in what estimation I hold the success of this association when you see the banner I have taken the liberty to unfurl and dedicate to this association, and which I beg now to offer for the acceptance of its members; also the reading-desk; and last, though not least, the portrait of Professor Spooner, than whom no man is more worthy to occupy a conspicuous place upon our walls,—no professor has more assiduously endeavoured to uphold the dignity and honour of the profession. Amongst his students he has been almost idolised; presentations of plate have almost showered upon him; and the various improvements in the rules and regulations of the College, especially that appertaining to the preliminary examination, which he has now adopted, having rejected two candidates for admission at the commencement of this session. During the year that is passed we have had to contend with one of the most formidable and important strikes of the shoeing smiths that ever occurred in the annals of England. Thanks to this association, we maintained a steadfast and honourable conduct towards each other, and the result was a signal and complete triumph. We are now our own masters in our own shops, which was not the case before, and have now better men working for us; they are more obliging and more attentive to their duties; the men are not unsettled or dominated over by a restless and mischievous club. During that period of excitement the misguided turn-outs assaulted and tried to intimidate some of the men who were working. I, being your president, was waited upon and requested to assume the unenviable character of public prosecutor. I saw the justice and the necessity of such a course. This was attended with considerable personal inconvenience, having to attend the court eight or ten times, two, three, and even four and a-half hours at a time, exposing myself to the odium, ill-feeling, and danger from the misguided men. On these several occasions there was one gentleman who, without a particle of vindictive feeling in his nature, but who, being prompted purely by a high sense of honour, evinced sufficient moral courage as to dare to do his duty, and to share with me the responsibilities and the dangers. I feel it to be only my duty to make known that you, sir, kindly extended to me your countenance and support in that trying hour. Three of those men were imprisoned; and they have each of them since called upon me, not with feelings of spite and malice, but to express their sorrow and their contrition. Amongst the remarkable actions of this association this one will shine most prominently. I shall therefore, with your permission, proclaim this "*Triumph the First*" for our association. Our first paper was introduced by Mr Haycock, on Pleuro-pneumonia. This dire disease was handled in a most able manner, and occupied two evenings' discussion. The next was a paper by Mr Lawson, on Tetanus in the Horse, indicating an amount of success (nine out of eleven cases) which has never been attained before in the annals of veterinary science—at least, no such success has ever been recorded. It is our bounden duty to meditate upon this fact. It is, perhaps, the greatest step in advance ever taken in the treatment of this disease, when we see that gentleman come forward and take great pains to instruct us in the system he adopts, and by which our success may be equal to his; and since which announcement practitioners have acknowledged to me complete success by its adoption. To cure one case of tetanus, even, is no child's play. This we all know; often, alas! to our sorrow and humiliation; but to be initiated into a system resulting in such success as this is conferring a benefit upon his profession that deserves our lasting gratitude. Let us not be chary in this matter; let us speak right out, and accord to him the honour that is his due, and hand over freely to him the laurel branch, and see that the wreath is put upon the right brow. Therefore, with your permission, I will proclaim this "*Triumph the Second.*" I allude to Mr John Lawson, jun. Our next paper was introduced by Mr Howil, on Puerperal Fever in Cattle. It was compiled in a most practical and masterly manner, and what I characterise the best written paper upon that subject in our literature. But the impetus which has been given and the emulation which has been excited have not been confined to this association. There is in the town of Manchester a young man whose innate sense of diffidence and modesty deprives us of his appearance amongst us in public, but who is working out one of the most difficult problems we are ever called upon to solve, viz., the cure of canker. He is maturing and developing a successful mode of treatment which assumes the character of apparent certainty. During my thirty years' practice I have treated scores of cases of canker, and I believe no man has more diligently or persistently employed the best known remedies, but very rarely indeed with success. To cure one bad case of canker, even, is no child's play. This we all know; often, alas! to our mortification.

Many eminent men admit their inability to cure canker. But here is a young man whom I have seen to cure four cases hand running,—four bad cases—cases which I freely admit I should not have been able to cure at all; nor do I know any other practitioner who could have cured them. I do not think I am reflecting any disrespect upon the members of the profession in saying this much; but what I am desirous of doing is to give honour to whom honour is due. This is another mighty step in the onward progress in our profession, which, I believe, has never been gained before. Let us hand over to him the laurel branch, and place the wreath upon the right brow. And, with your permission, I will proclaim this "*Triumph the Third*" for our association. I beg to congratulate this association upon these substantial results. It is only right and proper that we should be up and doing. It is no idle word that we live in an age of rapid progress, that science is making rapid and gigantic strides. It is almost certain that, before another summer's sun warms this our happy isle, the Manchester daily papers will contain the events that occurred the evening before in Washington; and before Christmas, they will contain the events that occurred the evening before in Calcutta; and in twelve months later, we shall have the events occurring in Pekin of the preceding evening recorded in our Manchester morning papers. We stand upon a loftier eminence than our forefathers did; and I cherish the hope that these associations will stimulate fresh vitality, so that the rate of progress we have made may be maintained; and if it is maintained at the same ratio for the next five years, and each of the other associations in England and Scotland will contribute an equal amount of beneficial result, the gross advancement which will have been made may be likened to the engineering and mechanical sciences (they having made equal progress) commencing and completing the construction of a Britannia tube, with its two million rivets, in one week, and fixing it in one day. But, sir, much as has been done, there remains yet much to be done. The deplorable dissensions in the profession, and which have unfortunately existed now so long, though it is not for me to say who is the party to blame, there are parties in London and in Edinburgh whose characters are esteemed by me too highly for me to even whisper a breath of disrespect; still, I feel bound to say, the spirit of disunion and antagonism existing between the Highland and Agricultural Societies with the Edinburgh College on the one hand, and the Royal College of Veterinary Surgeons on the other, has all along operated like a millstone around the neck of the profession, effectually preventing all successful efforts in obtaining a new charter or other advantageous enactment; and until a cordial unanimity between these institutions have been achieved, the complete success of provincial veterinary medical associations will not have been attained. Again, there still confronts us a long list of diseases which nearly always baffles our best treatment; but that they are curable diseases is proved by one every now and then being cured. I look forward to the cordial alliances and the veterinary congresses of these associations contributing mightily to this consummation so devoutly to be desired. Therefore, until some method has been adopted whereby the cure of all curable diseases in our patients has been achieved, the complete success of Provincial Veterinary Medical Associations will not have been attained. Again, there exists one vexatious question which often appears to blacken the fair fame of our profession, bringing down upon its members ridicule, humiliation, and disgrace. I allude to the incongruous and unfortunate difference of opinion upon the soundness of horses, in our courts of justice. Do you tell me it is the result of different construction and organisation of the minds of different men? Such an answer appears very sorry, very inconclusive, and unsatisfactory to me; for I am bound to say it often appears to me that we allow the spirit of partisanship to have more power over our opinions than our conscientious convictions, occasionally causing our best men to stultify themselves and to stultify one another. I believe, if we will base our opinions upon broad principles and sound judgment, an approximation to unanimity may be arrived at; and until that is achieved, the complete success of Provincial Veterinary Medical Associations will not have been attained. With these observations, I beg to thank you for the honour you have done me by coupling my name and identifying me with these most useful associations, and the good spirit you have shown towards them.

The meeting was in every way satisfactory, and one which will be long remembered by the profession in the North of England.

PERISCOPE.

THE WINTER DRESSING OF SHEEP.

The following paper was read by Sheriff Robertson, Erray, Tobermory, at the December meeting of the Mull Agricultural Association :—

In consenting to write a paper on the subject of the "Winter Dressing of Sheep," I had no idea of the difficulty of the task I had undertaken. The subject is, however, one of such importance to the stockholders of the country in general, and to those of this district in particular, that I do not grudge the labour if it turns out of any value to men whose avocations I so cordially sympathise with, and whose character for sound common-sense intelligence I so much admire. Owing to the extraordinary price wool commands at present, it is of vast consequence to the farmer to cultivate its growth and improve its quality. A man who makes two blades of grass grow where only one used to grow is pronounced a public benefactor; and in these times a man who makes two fibres of wool grow where only one used to grow, must be regarded as equally entitled to our gratitude; and the question under discussion has reference to this consummation. My own experience is too limited to enable me to lay down any opinion with confidence; and were it ten times as great, there might be some risk in doing so, considering the very great diversity of opinion that exists on the subject. As the only way of making this paper of any value, I give in it the result of communications I have had from some of the most respectable and extensive wool-brokers, consumers, and others in Scotland, whom I have the pleasure of numbering among my acquaintances. I have received from all what appears to me very valuable information, and it enhances it in my estimation that it was given with a ready politeness that I am grateful for, and an ability that I rejoice to think is brought to bear on our interests in a way we can scarcely fail to benefit by when our wool goes to market. But I am somewhat perplexed by the different ideas entertained in the trade as to the proper treatment of wool when growing. When I see men extensively engaged in wool transactions, and through whose hands vast quantities of wool pass, if not daily, I may safely say weekly, having different opinions on the question, What constitutes the most profitable dressing for wool? I must come to the conclusion that no standard of treatment has yet been discovered, and that in all probability the dressing must vary in order to suit the great variety in climate, and other circumstances peculiar to different parts of the country. Indeed, the gentlemen who have favoured me with their views say this; and when we consider that the weight of the fleece greatly depends on the condition of the animal, and as the condition of the animal depends not more, if so much, on the winter dressing it receives, as on keep and shelter, we see the great difficulty of establishing a standard.

One thing, however, may be taken as established, viz., that sheep kept in high condition can dispense with all dressing better than sheep ill kept and in low condition, and the reason is obvious. The growth of wool on a well-conditioned sheep is more healthy and rapid, and there exudes from the skin of the animal an oily substance known as "yolk," which resists the action of the rain, and yields a natural protection that we would do well to imitate. The skin of low-conditioned sheep is dry, and the wool is also dry. Yolk is secretable in small quantities, and artificial protection becomes necessary. It is reasonable to suppose, that whatever artificial application bears the most resemblance to the natural protection of yolk must be the best for the carcase as well as for the wool, and it is impossible to arrive at this resemblance without the use of fatty substances. The dips in use have none, and are intended principally to protect the skin, not so much from the weather as from ticks, the attack of the fly, and the like, and most of the gentlemen I wrote to are agreed that the fibre is rather deteriorated than improved by these. One gentleman, whose opinion I consider entitled to great weight, because he is a large consumer, says on this point:—"Any dip, highly charged with arsenical or alkaline properties, must have the effect of hardening the staple and injuring the texture of the fleece, although this depends on the condition and health of the animal when dipped." Another says that "dressing (dips) that does not affect the colour of the fleece if applied year after year, tends to stint the growth and weakens the staple."

Winter dressing in this inclement wet district must then, I think, consist of fatty or oily substances as one of its component parts. So far there is no great difference

of opinion—indeed I may say none—among the gentlemen I have consulted. Here, however, irreconcilable differences arise. I applied to five, and three of them are in favour of tar in connexion with one or other of the ingredients I have mentioned, and two decidedly against it. I will recapitulate their views, and

1st, As to those in favour of tar. In the first place, they consider that a good mixture of tar and butter, or other material having the same properties as butter, affords the best protection to the animal in a climate like ours. In the second place, one of the three says, that "As the value of Blackfaced and Cheviot wools almost entirely depends on the length and strength of the staple, I recommend tar and butter or good grease as the most beneficial dressing. Fineness of quality is not so requisite as length and strength." Another of them says that when the sheep have "to contend with a very wet climate, no dressing has proved so beneficial to the preservation of the animal, or so advantageous for the growth and the sound condition of the fleece, as a proper mixture of tar and butter, or a grease instead of butter possessing the same qualities for smearing that butter has. But," he goes on to say, "great care should be taken in selecting smearing materials." He recommends the best American tar. Archangel and Stockholm tar generally, he says, "contain much more of a caustic or burning material than American, and are much more apt to leave the fleece of a dark, dull, brown colour after smearing." This gentleman recommends light smearing in Cheviots, the fibre being finer, and the wool thicker on the animal, affording a better natural protection than the coarse fibre of the Blackfaces, and more liable to injury in the washing. The third says,—"Where much exposed, and many moss rubbings which would affect the colour of the wool, I should consider smearing the best dressing. Where the farm is sheltered and near the sea, and the land hard and clear of moss, you may keep the fleece white by using some of the non-colouring preparations. On the whole, however, for your part of the country I would be decidedly in favour of smearing, if properly managed, and the best materials used.

2d, The gentlemen who condemn the use of tar entirely state their reasons, and I consider them of great weight. One of them recommends some preparation partaking of the nature of the yolk, and calculated to protect the animal and stimulate the growth of the wool, and thinks the discovery of such preparation not beyond the reach of science. He does not, however, state any specific objection to tar. The other does. He says—"The use of tar has been much discussed, and it is even yet a turning point of opinion. But it is patent to the most ordinary perception that any substance put upon wool which has just to be taken off again at great trouble either to the man who puts it on or to him who takes it off, that its use can only be warranted by some other advantage than that of benefit to the wool." This gentleman is of opinion that if tar were indispensable to the proper preservation of a sheep stock from the effects of a wet climate, it would be used by the Highland shepherds in Australia, where periodical heavy rain falls, who are well acquainted with its merits.

The specific objection to the use of tar here made, is touched upon by the consumer already quoted. He says—"The only objections to smearing with a mixture of tar and butter or a proper substitute for butter, are first, the expense; and second, the discolouring or straining the wool. As to the first, it is scarcely a fair objection, for although admitted to be an expensive process, yet if by its use wool-growing can be carried on profitably in districts and climates where without this treatment it could not be grown to profit, then smearing with tar and butter at once classes itself as one of those unavoidable evils which must be submitted to, or it resolves itself into a simple question of profit or loss." In another part of his very instructive communication, he says, in reference specially to Cheviot wool—"Heavily smeared wool necessitates the using of a powerful alkali in scouring to remove the tar; and all wool being soluble in a hot solution of alkali,—and the finer the wool the more easily it is dissolved,—it follows that when a strong solution of alkali has to be used to remove the tar from wool, the fibre is often partially dissolved, and its toughness and elasticity destroyed, causing much loss in weight as well as a great depreciation in the quality and the consequent value of the manufactured article." This is not intended as a condemnation of the use of tar, but of the abuse of it by being laid on in too large quantities, and in combination with inferior materials. For he says further,—"The beneficial effect of proper smearing with tar and butter, or a grease possessing the same qualities as butter, is very plainly shown in the fact that laid wools (that is wools smeared with tar and butter) spin to finer numbers than white wools of the same class; thus proving that wools, when properly smeared, attain greater length of

fibre, and are otherwise more perfectly developed than the same class of wools grown even on low and rich lands, but not smeared." He goes on to say, (and I think this particularly merits the attention of the wool-grower,) in reference to non-colouring dressing,—"Butter, oils, and other fatty matters, when properly applied, confer on the fleece a certain power of throwing off the water, and sustaining the animal heat; but another difficulty there arises; for although the substances above enumerated, or preparations of which these substances form the basis, to a certain extent protect the animal, and thus tend to promote the growth of the fleece; yet they (we may say without exception) give the wool a yellow or brown tinge, and lower its value. It is not a fair test of the non-colouring qualities of a salve to wash a fleece soon after it is separated from the animal, and because it washes white conclude that the salve is non-colouring; the fleece should lie for at least twelve months in the state it was dipped, and if it then washes white we would be satisfied with it in this respect." It will thus appear that the preponderance of the trade, so far as I have ascertained its views, is with butter and tar, and taking the question in its relation to the trade, I was not prepared for this result.

I will now glance at it from the farmer's point of view; and 1st, As to whether it is more profitable as regards the wool alone, to use such dressing as will preserve it white, or non-colouring dressing, or to smear with good tar and butter. The difference in value between unwashed white and laid wools is in blackfaced from 20 to 25 per cent. in favour of the former. It is more in Cheviot, say from 25 to 30 per cent., according to the returns I have received. The increase in weight on laid-over white wools is variously stated from 45 to 78 per cent. By basing his calculations on the price actually got for his wool, a farmer, by means of these figures, can, without much difficulty, arrive pretty near the advantage or disadvantage of the one system over the other. But a fair average should be taken—say 27½ per cent. in favour of the white wool in the matter of value, and say 57½ per cent. against it in the matter of weight. It is quite possible greatly to increase or diminish this difference by high keep and shelter, but taking the average of the farmers in this district, the differences above mentioned will, I think, very nearly represent the estimates furnished to me. Tar and butter are admittedly the most expensive dressing hitherto applied, and in order to make correct calculations, allowance must be made for the difference against smearing in the matter of expense. A sheep to be really well smeared cannot cost less than 9d. one year with another: a dip will not cost above 4d., but there are preparations used, such as tobacco juice, and certain oils, &c., that cost at least half what smearing does, in some instances as much. I will give an instance of the kind of calculation I mean. Take a stone of laid and one of white Highland wools. The value of the laid is say 18s., and it consists of four fleeces, which cost 3s. in the smearing. This reduces its value to me to 15s., or 3s. 9d. per fleece. The value of the white, both being of the same class, is 24s.; and it consists of six fleeces, which cost 2s. in the dipping. This reduces its value to me to 22s., or 3s. 8d. per fleece; leaving 1d. per fleece in favour of the tar and butter. Take Cheviot wool: laid, it is worth 36s.; white, 48s. Deduct 3s. for smearing, and 2s. for dipping, and you have respectively 33s. and 46s., or 8s. 3d. per fleece for laid, and 7s. 8d. for white, showing 7d. per fleece in favour of tar and butter. I do not mean these calculations to be taken as representing the real actual state of matters, or the real value of either system: but at the same time I think they are sufficiently suggestive, and show that great judgment and caution should be observed by farmers in making up their mind on the winter dressing they give their sheep. In the next place, as to the benefit to the carcase derived from winter dressing, it is universally admitted to be indispensable in any part of Scotland; and it being used for the purpose of protecting the animal from the inclemency of the climate, it is natural to suppose that the necessity does not arise in an equal degree in dry and sheltered places as in humid and exposed ones. By studying the reports of the Meteorological Society, which, taken in connexion with other reports, such as the Registrar-General's, will be found extremely instructive and interesting, we find that the amount of rain which falls in different parts of Scotland varies exceedingly. The average over the whole of Scotland is under 45 inches, while here in Mull, and in many other parts of the west coast and Hebrides, the average is upwards of 80 inches. To bring the general average to what I have stated, the rainfall in many parts of the country must necessarily be very small, and it does not stand to reason to suppose that outlying stock like sheep should not require a greater amount of artificial protection in the one case than in the other, especially as rain on the west coast and Hebrides is usually accompanied by high wind, which makes it exceedingly penetrating and difficult to guard against. As regards the carcase alone, then, what we especially require is a dressing that will resist the penetrating rain that falls in

such large quantities in this district, and the great desideratum is a dressing that will accomplish this without deteriorating the staple of the wool. I have put myself in communication with farmers in different parts of the Highlands, and while some of them—with that intelligence which has of recent years shone so conspicuously among agriculturists and stockholders as a class, desirous to avail themselves of the scientific discoveries of the day—advocate different smears, of which tar forms no part, the great majority are out-and-out advocates for good tar and butter. Most of these are able and willing to give cogent reasons for their preference; and I have only met with one or two who prefer tar and butter, if not solely for their own odoriferous sake, for the mere reason that they and their fathers and their fathers' fathers had used them, and nothing else. One gentleman mentioned a striking instance of the protecting power, and consequent benefit to the animal, of tar and butter. A shepherd was smearing a sheep, and as he finished the one side, he, in turning the animal, observed it was not one of his own flock, and at once threw it off the form without completing the operation. The sheep thus half smeared remained all winter on the farm; and the shepherd remarked that, invariably on a cold, windy, and wet day, it fed with the smeared side to the weather. This, however, proves nothing as to the advantage of one dressing over another, but a great deal as to the benefit of winter dressing generally, and the power it confers on the animal to seek its food in bad weather, without exposing its body to wet and cold in the sensitive condition that nature leaves it in. One of the gentlemen I have consulted says that the use of tar is extending in some parts of the north of England where the rainfall is heavy and the weather boisterous, and that it is maintaining its place in most parts of the country. Another says that the reverse is the case, and especially that in Caithness it is going fast out. There are two reasons why the use of tar may diminish in Caithness, at least for a time, —viz., in the first place, it is dry, both as regards soil and climate; in the next place, the price of white Cheviot wool has been exceptionally high for the last two or more years, which has induced many holders of Cheviot stock, both there and elsewhere, to use non-colouring winter dressing. Whether or not a permanent change has set in remains to be seen. Considering the expense of smearing with tar and butter, and the difficulty that has existed since the Crimean war broke out of procuring them of good quality,—a difficulty greatly increased by the war now going on in North America, and considering further the vast number of dips and dressings pressed upon the sheep farmers, it is wonderful the extent to which tar and butter hold their ground. With so little practical experience I cannot assume to advise stockholders in this matter, further than to use a smear of good materials, whatever it may be, although it may, in the first place, cost a little more money, in preference to cheap materials, which, as a general rule, must be inferior in an least an equal degree to their cheapness, and may do more harm to a stock in one season than the saving upon them would make up in twenty. Dips are very well to kill ticks and other insects and animalculæ that infest sheep, but for the purpose of protection from the inclemency of the climate of this district they are worth very little. In conclusion, I may mention that for my own stock I use the best tar and butter I can get, sometimes mixed with grease, which is said to possess the same good qualities as butter. I get a pound of butter for every sheep I smear; twenty-six pounds are put to the eight pints of tar, and this carefully applied to twenty-six animals. The result is satisfactory—my stock is clean, I get a ready sale and a good price for my wool, and I have never lost an animal from the effects of smearing. I have tried dips for preventing the fly striking my sheep, and was satisfied with the results. I have tried them for winter dressing, at intervals, on part of my stock, with a very unsatisfactory result; I will, therefore, rest content with past experiments, and try no more of them. If, however, as I hope may ere long be the case, a material is discovered with the beneficial qualities of tar and butter that will stimulate the growth and improve the fibre by increasing its length and strength, without its prejudicial effects of staining the fleece, I shall esteem the discoverer as conferring no small benefit on the stockholders, not only of this district, but of all parts of Scotland, and wherever the inclemency of the weather makes winter dressing indispensable.

After the paper was read, the following remarks were made by Mr Thornburn, Calgary, who said he had listened with pleasure to the able and comprehensive paper now read by Sheriff Robertson, on a subject of the very greatest importance to the flockmaster:—The high price of both mutton and wool, with the annually increasing rents of pastoral farms, are facts which press upon the stock farmer the necessity of giving the very greatest attention to the subject of winter dressing for sheep—*and all the more especially* when we take into consideration the very high per-centage

of deaths which occur among hill sheep in the district of Mull during winter and spring. The paper now read appears to me particularly valuable, as embodying the opinions of some of the most respectable consumers and brokers of wool, and I think it a very fortunate circumstance for the wool growers that the demands and consumption of the trade seem in exact ratio with their views as regards smearing and keeping white—the holder of a laid fleece having as ready a market as the holder of a white one. In the few remarks and figures which I have to submit to the meeting on the present subject, I shall refer to the profit or loss on wool arising from winter dressing, rather than its effects on the health of the sheep—believing as I do, that all fatty, greasy, or oily substances generally used for such purposes, when not charged with arsenical or alkaline ingredients, do not injure the health of the sheep. In approaching this subject, gentlemen, I can assure you I rather expect to get than give information, and therefore beg that the large and experienced flockmasters that surround me will put me right if the figures I proceed to submit do not tally with their views. I frankly confess, I have always been rather of the old school, that is, more inclined to abide by a good old system of which I thought I knew something, than draw the bow at a venture of which I had no experience, although the prize might seem a little tempting. I have, therefore, always smeared with butter and tar, using, occasionally, the finest American grease instead of butter. I give 1lb. butter and about 1¼lb. tar to each sheep, and in looking into the wool quotations in Liverpool and elsewhere for Cheviot wool, (which is the kind I shall select,) I find laid washed quoted from 36s. to 40s., and white washed ditto, 54s. to 60s. per 24lbs. Taking then 36s. and 54s. as the relative value of good laid and white Cheviot wool, washed, per 24lbs., let us see how the profit and loss will stand, always supposing we have a good hill stock of ewes of all ages, not exceeding five or six years, but not including wedder sheep :—In laid washed Cheviot wool my experience is, that five fleeces go to a stone of 24lbs. in average over a whole stock, and at 36s. the value per fleece will be 7s. 2½d., less the following deduction for smearing,—viz., 1lb. butter, 6d. ; 1¼lb. tar, 2d., calculating the Archangel barrel at 30s., and to contain on average 50 pints ; also 1d. per head for putting on, making in all 7s. 2½d., less 9d.—6s. 5½d. the clear value per fleece. Now, let us turn to white wool quoted at 54s. per 24lbs., and we shall first suppose it is dipped or poured with some comparatively light, cheap stuff, such as tobacco juice, which can be done for 1½d. a head ; and, as far as I have been able to ascertain, eight fleeces on an average over a stock of hill sheep will go to a stone, which, at 54s., gives 6s. 9d. as the value per fleece, less 1½d. per dip, leaving 6s. 7½d. for clear value ; but here I believe—though I give it as my belief only—that something like a penny per lb. further deduction should be made on this quality, partly owing to slight discolouration of the wool by the tobacco juice, but more owing to its not being a greasy substance, and so leaving the wool too dry for manufacturing purposes ; and if this opinion holds true, as I believe it will, it would leave 3d. per fleece to be deducted from the value of the wool, or what would be better, a mixture of grease to that amount in the dip used ; in either case the clear fleece value would be 6s. 4½d. In the second place, let us suppose the white wool is dressed with butter alone, and in this case it would perhaps be right to allow 1d. per lb. more for the wool than the price quoted, say 56s. per stone, as pure butter is well known to be the finest dressing that can be applied. In this case, butter being a fine adhesive grease, seven fleeces on average will make the stone, which at 56s. gives the high fleece value of 8s., subject to the following deductions,—viz., 1¾lb. finest butter, say at 7d.—12¼d., and 1¼d. for putting on, making 13½d. for dressing per sheep : but as pure butter does not kill ticks or cure scab, a previous dip with tobacco juice or some such substance would be necessary. This would cost 1½d. per sheep, which, added to 13½d. for the butter dressing, leaves 1s. 3d. to be deducted from 8s.—6s. 9d. the clear value of wool per fleece. In the third place, suppose the white wool is dressed either with Mr Girdwood's or M'Dougall's white smear, I have used both this season on a small scale as trials, and think favourably of them ; and further, have the authority of a gentleman who has tried them for expecting the following results—viz., that seven fleeces will on average be the stone, and that the value may be quoted 1d. per lb. below pure white wool, say 52s. per 24lbs., giving 7s. 5d. as gross value per fleece, less 1¾lb. stuff at 6d.—10½d., and 1¼d. per head for putting on ; in all 11¾d., leaving 6s. 5¼d. as clear value per fleece. I might go on, gentlemen, to talk of castor, olive, and other oils as winter dressings, but as I am of opinion that the results would not be materially different from those already shown, I shall sum up by placing the figures already advanced *beside each other* as follows, viz. :—

	s.	d.
Clear value of an average hill fleece of Cheviot wool, dressed with butter and tar—36s. per 24lbs.,	6	5¼
Do. do. dipped or poured with tobacco juice at 54s.,	6	4½
Do. do. dressed with pure butter and a previous dip—56s. per stone,	6	9
Do. do. dressed with Mr Girdwood's or M'Dougall's white smear—52s.,	6	5¼

I submit the above figures very humbly as the result of my experience, and as referring to the district of Mull. Heavier or lighter fleeces may be produced on the average of hill stocks in other districts, in proportion to the quality of the pasture, the condition of the sheep very materially influencing the weight of the wool. I have no wish, gentlemen, to favour one kind of dressing for sheep in preference to another, and therefore tender my views to you simply for what you may think them worth, assuring you at the same time that, taking as I do a very great interest in this important subject—a subject upon which there is, at the present day, a great and perplexing difference of opinion among both the growers and consumers of wool of the highest standing and greatest experience, I have left no stone unturned with a view to arrive at true average results. Of my success or failure I leave you, gentlemen, individually to judge. It is right, however, that I should add that my experiments with those dressings which leave the wool white have been on a much smaller scale, and are given with much more deference to the larger experience of others than what I have said regarding smearing with butter and tar.

DISEASED CATTLE IN LEEDS.

(*From the Leeds Mercury of 23d January.*)

MEAT formed so important a part of the sustenance of all classes of the community, that any observations as to the causes which may affect the condition of animals from which this portion of our food is derived, cannot fail to possess great interest. We have been favoured with some facts and statistics bearing upon this subject, which we lay before our readers, prefacing them with a return of the number of diseased cattle and carcases which have been brought into the various slaughter houses of the borough, and examined previous to their being exposed for sale, during the year ending December 31st, 1864, together with the result of that examination:—

	Examined.	Passed.	Condemned and Destroyed.
Beasts	787	574	213
Calves	99	—	99
Sheep	367	199	168
Pigs	161	92	69
	1,414	865	549

The principal disease which has affected horned cattle during the past year, is pleuro-pneumonia or lung complaint. No less than 347 have been sent to slaughter which were found to be affected with that complaint, which is a considerable decrease as compared with the year ending 1863, when the number was 477. Many of the cattle which have been attacked with this complaint were milch cows in good condition, and cowkeepers in and about Leeds have suffered severe losses among their cattle from this complaint. One of them Mr ——, of Buslingthorpe, lost 21 fine cows out of 25. They were very valuable animals, worth upon the average £20 each. He lost the whole of them by pleuro-pneumonia in seven weeks. In another case, a widow, Mrs B——, of Armley, lost in four weeks, last spring, no fewer than six cows out of seven she kept. In other cases the money loss has been very great. This disease, we have reason to believe, may be prevented in most, if not in all cases, by the application of measures of a purely simple sanitary character. Any one who has visited farmsteads where disease has been the most prevalent will generally have found the cattle in low, confined sheds, the animals breathing a hot vitiated atmosphere and every aperture through which pure air could enter carefully stopped up. In looking over the monthly returns of cattle affected by lung complaint, we ascertain that during the six winter months (from November to the end of April) in which cattle

are kept in sheds, there is only a decrease of four as compared with the corresponding six months. We fear that farmers and cowkeepers are much to blame in this matter, that pleuro-pneumonia is nursed in the mistals during the winter months, and that when spring comes the cattle are turned out into the fields to infect other stock. The prevention of the spread of disease among cattle has engaged the attention of the Government, and bills having this object in view were brought into the House of Commons last session. The committee which sat upon the bills, however, found it exceedingly difficult to legislate in the matter, principally owing to the very conflicting opinions entertained upon the subject. All must recognise how desirable it is that the public should be supplied with healthy butchers' meat, and healthy milk for the younger members of their families, but it is impossible that this can be supplied unless owners of stock more thoroughly understand the great importance of strict sanitary improvements in the buildings in which they house their cattle. It may not be out of place to mention a fact which will illustrate this. In December last, several cattle brought to slaughter, affected with pleuro-pneumonia, were subjected to examination, and on inquiry it was found that they came from Mr ——, of Adel. His farm was visited, and there were seen a number of fine milch cows confined in low ill-ventilated places; six had been sent away to slaughter in that week, and one that morning. The owner was recommended immediately to cause the cow-houses to be well whitewashed with quick-lime, to open all the closed apertures and let in fresh air, to disinfect his stock by using chloride of lime, and to keep a temperature of not higher than 55, and, by the adoption of these remedies and others of a similar character, the disease was at once arrested, and, to this time, no further loss in his stock has occurred. Similar means have been adopted in other cases with the same success.

The following is the number of diseased cattle which have been sent to slaughter on account of their being affected with pleuro-pneumonia, and which were examined in the years ending December 31st, 1863, and December, 1864:—

Month.	1863	1864	Month.	1863	1864
January	33	23	July	56	51
February	24	28	August	60	32
March	26	22	September	53	27
April	21	28	October	28	18
May	53	23	November	28	23
June	64	37	December	31	35
			Total	477	347

TRICHINOUS DISEASE IN AMERICA.

Trichinous disease has lately been observed in the western part of New York. Dr L. Krombein gives the following account of some cases seen by him in Cheektowaga:— "T. F., a blacksmith, aged thirty, and his wife, aged twenty, were taken ill simultaneously, the 29th of April, with stiffness of the limbs and the whole body, bloating of the face, with a slight œdema of the eyelids. Soon there followed distinct pains in all the limbs and body, so that they could not bear even the slightest touch. By and by the pains diminished; there set in very laboured respiration and great prostration, combined with very profuse sweats. In the commencement of the illness they had both had slight diarrhœa for a few days, and during the whole course of the sickness they suffered greatly from sleeplessness and unquenchable thirst. The woman, who was in the third month of pregnancy, had aborted on the 12th, and from that time there was œdematous swelling of both lower extremities. Fever in both patients was very high, (pulse 138 in the man, 146 in the woman;) but the skin was not hot, but rather cool." The man died on the 16th, the woman on the 17th of May. The microscopical examination of the muscles of the thorax, abdomen, and thigh disclosed many trichinæ, both in the encysted and free state. The same disease was observed in another family of seven persons, living at a distance of two miles from the above patients. At the time of the report the father and mother were dead, and the remaining members of the family in great danger. In a specimen of muscle from one of these cases a number of free trichinæ were found. Some of the sausage they had eaten was also found to contain a number of the parasites in an encysted state.

ON THE PROPORTION OF BLOOD GENERALLY, AND OF ITS SEVERAL CONSTITUENTS, IN VERY YOUNG DOGS, AS COMPARED WITH ADULT ANIMALS.

Dr Panum finds, on comparing the blood of a newly-born dog with that of the mother, that the former contains a much larger proportion of solids than the latter; and that this difference is essentially attributable to the very large proportion of red corpuscles contained in the blood of the young animal, as is shown by chemical analysis, by the specific gravity of the defibrinated blood, and by the evidence obtained from Welcker's "colour test." His results are consequently in full accordance with those of Denis and Poggiale. Panum found in 1000 parts of the defibrinated blood of the mother 138·3 solid residue, in the blood of these recently-born animals 192·6, 222·3, and 228 parts of solid residue. The specific gravity of the blood of the mother was 1039·6; of the young, 1053·6 and 1060·4. On examining the blood of somewhat older animals, (seven weeks,) Panum found that the quantity of solids, and especially of red blood corpuscles, had undergone a diminution, whilst the proportion of water and of fibrin had increased; but that at a still later period, when growth was completed, the proportion of solids had again risen, without, however, their having attained the high per-centage characteristic of the recently-born animal. Other points, which he believes to be incidentally established by his investigations, are, that the composition of the fœtal blood as regards the proportion of red corpuscles is essentially independent of the composition of the maternal blood, appearing to be a function of fœtal cell-formation. Further, it seems that the proportion of water contained in the blood at different ages by no means exhibits a corresponding ratio to that present in the different tissues, which, as Von Bezold has shown, constantly diminishes with the advance of life. Again, he believes he has proved that the quantity of blood in the newly-born animal is somewhat smaller than in older creatures, but the difference is small, and sometimes scarcely observable. Lastly, from some experiments on the effects of inanition in dogs, he finds that, *cæteris paribus*, well-fed, fat animals contain a smaller proportion of blood, in proportion to their weight, than sparingly-fed, lean young animals.

THE SHEEP FLUKE—DISTOMA HEPATICUM—IN MAN.

Professor Biermer of Berne reports the following case, which is of interest, from the rarity of the occurrence of the distoma hepaticum in the human subject:—A soldier, aged forty-three, had jaundice in 1862, in Sumatra. The disease continued until his return to Europe. He came under treatment on January 5, 1863. His skin was of a deep yellow colour; there was no hypertrophy of the liver, no fever, hypertrophy of the spleen, bronchial catarrh. Mechanical jaundice from some unknown cause was diagnosed. Some days after, he was attacked with sharp pains in the region of the liver, and violent cough, with sanguinolent sputa and vomiting. There were signs of infiltration of the right lung, and the jaundice was increased. On the 31st of January an extremely painful diffused swelling of the parotid appeared on the left side, accompanied by intense fever. On the 11th of February there was sanguineous suffusion in the axillary region, which soon invaded the right side of the thorax, and was accompanied by violent pain. He died on February 18th. The post-mortem disclosed a liver of normal size; the gall bladder distended, but not projecting beyond the free border of the liver. A sound introduced by the duodenum into the ductus choledoctus met a slight obstacle, the cause of which was the presence of a distoma hepaticum, 2·4 centimetres long, and 1·1 in width. The parasite filled without distending the duct. The cystic duct was free, but the hepatic was completely obliterated and changed into a solid cord for the extent of about a demi-centimetre. The two hepatic canals were distended into a number of ampullæ beyond the obliterated point. No other flukes were found in the liver or in the intestine. The author thinks that the hepatic lesions were originally due to the presence of the parasite. In the sheep the distoma produces inflammation of the biliary passages, with subsequent obliteration and distension. In the above case, a microscopic examination showed that the obliteration owed its origin to adhesive inflammation.

VACCINATION FROM THE COW.

THE Paris correspondent of the *Medical Times and Gazette* writes, that Dr Lanois, a young physician of enthusiastic temperament, having listened to the recital at the Lyons Congress of the Neapolitan mode of vaccination, repaired to Naples to thoroughly study the subject under M. Negri, the successor of Galbiati, who has now the management of the enterprise in that city. Highly satisfied with what he observed, he brought back with him to France a heifer vaccinated with all the precaution which M. Negri deemed necessary. The cow, firmly tied, is thrown down on its left side, and its body so flexed as to render the abdominal region supple. A portion of the surface of the right inguinal and hypogastric region, from one to two square decimetres in size, is carefully shaved, and then, by means of a strong lancet with cutting edges and a rounded point, slight scarifications, from six to ten millimetres in length and ten to fifteen millimetres from each other, are traced in a parallel line. Other lines of scarifications are also made, so that there may be about sixty or seventy ranged over the entire surface. They are not made deep, and within the lips of each is deposited the vaccine virus collected on the flat side of a knife from the pustule already produced on another cow. The inguinal region is deemed the most fitting place for the vaccination, as the epidermis is very thin there, and the skin is mobile, while the part is protected from dirt, friction, and atmospheric influence. From the heifer brought over by M. Lanois, children and another heifer were vaccinated at Lyons, the pustules whence the virus was taken being at their fourth day only since inoculation. Indeed, M. Negri vaccinates from pustules only seventy-two hours old; and he does not open the pustule in the ordinary way from the exterior, but entirely removes it, and even a portion of the dermis situated below it. It is of great importance that this portion of the dermis should be well scraped away from the excised pustule, so as to expose the virus in its purest condition. To do this effectually requires practice; but the efficacy of the vaccination much depends upon it. All the vaccinations made at Lyons were as successful as those observed at Naples. In a paper which M. Lanois has laid before the Academy, he states that the results of the observations which he made at Naples exhibit the following advantages of the practice:—The possibility of a constant transmission of virus from cow to cow, at all seasons of the year, in sufficient quantities to meet the demands of large establishments; the regeneration and not the impoverishment of the virus by this transmission; the easy practice of the vaccinations; the innocuousness of the course of the eruption; and the certainty of the prophylaxis.

Dr Philippeaux, from whose paper in No. 51 of the *Gazette Hebdomadaire* we have derived some of the above facts, in reply to the question why this practice, if so good, has not become generalised during half a century, points out that vested interests have stood in its way. Thus, while Ferdinand had his own children vaccinated from the cow, he compelled his subjects to have theirs vaccinated in the ordinary mode at the national establishments; and even members of the Vaccine Committee, who opposed the introduction of the vaccination from the cow, resorted to it for their own relatives. Then, again, it is a more expensive process than the ordinary one, for many heifers have to be kept on hand, so that one may be vaccinated every eight or ten days. In order to acquire the necessary facility and a complete knowledge of this mode of vaccinating, it is necessary that the practitioner should, like M. Negri, make it a special occupation.

FATTENING LAMBS FOR THE LONDON MARKET.

MR EVERSHED, in his Prize Essay on Agriculture says:—"On a stock-farm of 300 acres about 200 Hampshire ewes are bought in July or August. They are kept on stubbles and layers as long as the feed lasts, and are then removed to the turnips. White turnips are considered best for milk at the first stage; but later, when the lambs begin to eat, swedes are preferred, as being sounder and better food both for them and the ewes. Hay-chaff is always given before lambing. Lambing commences in the middle of December, and should be over by the middle of January. The lambs fall in a fold, and, if strong, are removed with their mothers to the turnip-fields in a few days. As soon as the lambs begin to eat they are supplied with cut swedes, oil-cake, beans, and cut-clover chaff, *ad libitum*. Oats, maize, and white or

partridge pease are partially used. The ewes are also supplied with an unlimited quantity of similar food, oil-cake being preferred. The object is to sell them as soon after the swedes are finished as possible, since clover and summer forage are too valuable for hay to be spared for them. As soon as the lamb is of an age to eat freely the ewe begins to thrive fast, and with such liberal treatment is fat by the middle of May. The best plan for late feeding is to remove the swedes or mangold to the stubbles and clovers.

"The horned Dorsets, which are sometimes kept, drop their lambs a month earlier than others. A few of them are sometimes mixed with a Down flock, under the impression that they incite them to earlier breeding. They are more prolific than other breeds, and their lambs are larger, but only make the same price per head as the Downs: 5 stones of 8lb. is a fair average weight for the latter, and nearly 7 stones for the Dorsets.

"Of late years 34s. to 35s. per head has been the average price of well-managed flocks, the first sales of the best lambs reaching 40s. The lambs were formerly all sent to market in one-horse carts, and are still frequently so conveyed. The sales commence at twelve weeks old. The Oxford Down ram has been tried lately, and also the Shropshire, but Southdown rams are preferred; close-coated lambs fatting faster, and selling more freely. The essentials in a good ram for this branch of breeding are, a deep and heavy carcase, good quarters, and short wool."

SHEEP MANAGEMENT IN HERTFORDSHIRE.

Mr Eversheed reports that, "though neither the breeding nor the fattening of sheep is carried out to a large extent, most of the better farms have a flock of ewes, generally Hants Downs. The Cotswold tup is most in favour; Leicesters and Lincolns are also used. The ewes are folded on turnips, with some dry food, such as malt-combs, with straw-chaff, or trefoil 'stover'—*i.e.*, the straw after thrashing the seed."

"The lambs are dropped between the middle of January and the middle of February. After lambing, the best managers give the ewes a little oil-cake or a few oats; neither beans nor cotton-cake are liked for suckling-ewes. Most farmers now grow some mangold, to be given to the ewes with dry food on the young clovers. Lambs are weaned early in July, and are well kept on the mixed clovers and on sainfoin, wintered on roots, and sold fat after being shorn. They get cake or corn early in autumn, or sometimes from weaning-time. The half-bred lamb will, with such treatment, weigh 10 to 11 stones at fifteen months old, and will sell for 60s., paying 1s. a week from birth. Such early feeding with corn should, however, never be commenced unless it can be steadily maintained, with a due admixture of green and dry food. The value of the purchased food is sacrificed by any check.

"The ewes are usually fattened; and this is generally desirable, because an old Hampshire crone, which cost from 40s. to 44s., is worth when poor after shearing only 25s. to 28s. If fattened after weaning-time, they are put on the freshest after-crop of clover and sainfoin, with a pint of beans daily, or 1lb. of cake, and finished off on rape or early turnips. Of late years, the high price of old ewes and the danger of bringing the foot-complaint into the farm has led to the purchase of younger sheep, which are kept several years.

"The half-bred ewe lambs are sometimes drafted into the ewe flock, and are either coupled with a long-woolled ram, or a west-county Down. The excellent constitution and general good character of the half-bred ewe is an inducement to adopt this practice, which however requires caution. A lamb, mongrel to the third generation, must have been bred under the auspices of a very skilful breeder if he be not a worse animal than one of the first cross. Such stock often make bold-looking, well-sized lambs; but in the spring they prove more scanty in their proportions, longer in the legs, and lighter both in wool and carcase than better bred tegs."

THE BENNINGTON FLOCK.

The Rev. J. Clutterbuck, in "Agricultural Notes on Hertfordshire," writes:—"After a word of commendation of the Hoo flock of 400 Sussex Downs, improved of late by rams from Babraham, and a word of warning as to the ultimate results of

cross-breeding between the long and short woolled races, however promising at first, I pass on to speak of that which for not less than two centuries has been called "the far-famed Bennington flock." Bennington is a village near the centre of the county, between Stevenage and Standon. The flock, which is still owned by the descendants of those who first formed it, is said to have sprung originally from the old Wiltshire horned breed, which appears to have formed the staple of the sheep stock in the midland counties of England up to the beginning of the present century. Within the memory of many persons, the horn, one of its distinguishing features, though reduced in size, was still retained, and in all respects the sheep were nearer their original type than at present. Attempts at improvements were at one time made by the introduction of Leicester, Gloucester, or Cotswold rams, though the produce of one, if not both these crosses, was weeded from the flock. Of late years the chief if not the only new blood, has been Lincoln; some of the flock still retain traces of the Roman nose, and other traits which render this flock remarkable, both as a record of the past, and a most interesting instance of the successful breeding of long-woolled sheep. It is said, and the assertion is borne out by the appearance, great size, and noble character of the flock, that the weight to which the ewes attain when fatted is 20 stones, that a teg has been known to shear 21¾lb. of wool; and that the average weight of two fleeces is 28lb., or one tod. The flock now unfortunately numbers only 200. The value placed on them for breeding purposes may be learned by the significant fact, that all the ram lambs are saved, and command a ready sale at good prices.

"It may be a question whether this breed and quality of sheep is that best fitted to a neighbourhood and soil such as that on which it has been so long and so successfully maintained; the mere fact of its existence, however, supplies an argument in its favour. They are said to do better and to be more hardy than the Lincolns, by which, from time to time, the stock has been replenished, and compared this year favourably with some Lincolns newly imported, which stood beside them in the fold."

BACTERIDIA AND MALIGNANT PUSTULE.

(*To the Editor of the "Lancet."*)

SIR,—The facts related in the following extract from a masterly article on Spontaneous Generation, by M. Jamin, in the *Revue des Deux Mondes*, are in all ways so interesting, that I make no apology for asking you to publish them. I ought to add, that the italics which occur in one or two places are mine:—

"Dr Davaine has devoted himself for some years to the careful study of a terrible malady of the 'charbon' genus—the splenic apoplexy, (*sang de rate*—anglice, 'blood,') which develops itself spontaneously in sheep, and is inevitably fatal to them. The blood of the diseased animals, examined under the microscope, has been found crowded with minute organisms allied to the *bacteria*, and which have been named *bacteridia*. This blood, injected into the tissue of another animal, carries these creatures with it, and death is certain. The malady is equally transmitted when a rabbit is made to swallow either the blood or part of an animal affected with splenic apoplexy. The infected blood may be dried and *kept for an indefinite time without losing the germs of the infusoria which it contains;* and whenever it comes to be injected or to be given as food, the disease is propagated. These facts being ascertained, as the symptoms of splenic apoplexy offer some affinity to those of another malignant malady known by the name of 'charbon,' (or 'malignant pustule,') inquiries were instituted as to whether there might not be a still closer bond between the two affections. 'Charbon' begins by a 'malignant pustule' of blackish colour, surrounded by a ring of vesicles, which must be speedily destroyed by caustic, if a general infection is to be avoided. On the 14th of April of the present year, (1864,) Dr Raimbert was called to a carter who had contracted a true malignant pustule on a farm where the sheep were suffering from splenic apoplexy. He removed the pustule, dried it at once, and handed it over to Dr Davaine, who examined it under the microscope. It was a perfect *felt, composed entirely of bacteridia.* Rabbits fed with it contracted splenic apoplexy in consequence, and died with their blood crowded with *bacteridia*, and communicated 'charbon' to other animals. Here, then, is a disease transmitted from sheep to man, and appearing in him under the form of a pustule, which in its turn has the power of communicating to all animals the parti-

cular virus which it contains. And what is this virus? A brood of infusoria of a special and venomous species. *The smallest quantity suffices to kill, because it suffices to sow and multiply the species.* The malady is transmitted by inoculation, because the animalcules pass from the infected to the inoculated subject; it is transmitted by the air, because the germs dry up and are wafted away, and become again sown; possibly also, as many hold, by the bites of flies, which thus become the vehicle for the transmission of the *bacteridia.* Such is the explanation, not less simple than certain, of the effects of a particular virus. The future will decide how far it is possible to extend to all analogous cases so fertile a theory, but already it is easy to understand the hopes of physiologists and to predict their success: perhaps we are on the eve of knowing, avoiding, and curing contagious scourges." *

The facts here detailed are not altogether new. Virchow, and some earlier observers whose names escape me for the moment, had already pointed out the occurrence, in countless numbers, of a kind of "vibrio" in the blood of *living* animals affected with charbon.

I have not been able to refer to Dr Davaine's own account of these researches; but before the case which he wishes to make out for the minute organisms he describes can be considered as finally established, other data will be required beyond those adduced by his reviewer. Not only must the constant presence of this particular species of *bacteridia* in the diseases in question be ascertained, but its absence in other putrefactive disorders. In all such cases there is a special danger, which those who have most studied the subject will best appreciate, of falling into the old error of taking for essential what may possibly be only an epi-phenomenon. The perfecway in which the facts seem to explain all the conditions, although a strong argur ment in favour of the interpretation set upon them, may, on the other hand, easily beguile us into a too ready acquiescence in it.

At the same time, the whole tendency of recent research, and of Pasteur's discoveries in particular, is to the effect that the tribe of minute organisms to which the *bacteridia* belong, in reality take the initiative in, and are the primary cause of, the zymotic changes with which they are found associated.

The uncontrollable *itching* which marks the first stage of malignant pustule, and is so characteristic of it, is, when considered as a phenomenon which betrays the presence of so many parasites in other parts, not undeserving of attention in connexion with Dr Davaine's view.

Should his discovery be confirmed by more extended researches, it is one of which it will be difficult to overrate the value.

As regards malignant pustule, its importance will be supreme. Diagnosis, pathology, origin, mode of propagation, and indications of cure, will be all summed up in the conditions which attach to the growth and multiplication of a single parasite organism.

In relation to diagnosis, the fact is one which might eventually become of the greatest possible use. For if it be true that the first brood of *bacteridia* is developed in the part which is to be the seat of the future pustule, the practitioner, armed with microscope and with the little "harpoon" with which the Germans did for trichina, might ascertain the characteristic presence of these minuter parasites by means of an operation not more formidable than the puncture of a grooved needle.

But, as M. Jamin rightly suggests, the interest of this discovery, should it be confirmed, culminates in its relation to the subject of contagion generally.

In a memorandum on the Investigation of Epidemic and Epizootic Disorders, which I drew up at the request of the British Medical Association in March 1863, there occurs the following passage:—

"In order to render the inquiry on which the Association is about to enter really comprehensive, it would be necessary to associate with the study of epidemics that of the diseases caused in man and animals by living parasites, external and internal.

"A fuller knowledge of the phenomena attaching to the dissemination of the prolific and minute germs of these parasites, could not fail to be of great use in helping to the true interpretation of the phenomena, which attach to the strictly analogous dissemination of the equally prolific and equally minute germs of contagious poisons.

"In particular, it would be of the highest value in showing, by data that could not be gainsaid, what is the real worth of the negative evidence now so implicitly relied on,

* *Revue des Deux Mondes*, Nov. 15, 1864, pp. 442, 443.

as an indication of spontaneous origin, and as opposed to the law of propagation by continuous succession.

"Additional reasons for putting the parasites and the contagions together in such an inquiry are—1. That at many points the two blend insensibly one into the other; 2. That, with the advance of knowledge, diseases are constantly being transferred from the group of common contagions to the group of parasites; and, 3. That there already exists amongst the most advanced thinkers on these topics, a shrewd suspicion that the two groups will eventually coalesce, and be found to be in their essence identical."

Dr Davaine's interesting discovery seems not unlikely to offer a striking illustration of more than one of the several positions here taken.

I am, Sir, your obedient servant,

WILLIAM BUDD, M.D.

THE MANOR HOUSE, CLIFTON, *Jan.* 5, 1865.

VETERINARY OPERATIONS—SETONS.

IN the management of the domesticated animals in disease, and even in health, setons are largely employed. They consist of pieces of tape or cord, which are carried for some distance under the skin, and allowed to remain to keep open a passage for the draining away of some morbid product, or to establish some curative or prophylactic process by the local irritation which they produce.

The word seton is from the Latin *seta*, a coarse hair or bristle—these having been the agents originally employed for this purpose. At the present time, the material in common use is coarse tape of a varying breadth, to suit the requirements of the case or the whim of the operator. It is introduced by means of an instrument called a seton needle, formed of a flat piece of steel, of about four lines in breadth, and from six inches to a foot or more in length. The one end has a square aperture or *eye*, while the other is flattened out and sharpened at the edges, which join each other at the point at an acute angle. The point is sometimes left sharp, to allow of its being pushed through the skin, though it is often made blunt, and it is passed through the skin by an opening made with a lancet. They are often used with a handle, into which the blunt end is screwed; and in this way they are more easily managed, and their course more certainly directed.

In introducing a seton, the skin is first incised transversely with a lancet, and the seton needle is directed between the skin and the muscles, its course being favoured by pulling out the skin with the left hand in front of the point of the instrument. It is usually carried in a direction from above downward, to permit a free discharge of the matter; and when carried far enough, a new incision is made with the lancet to allow of its exit. This is preferable to simply penetrating the skin by the sharp-pointed needle, as the wounds thus made are often so small that the pus cannot escape freely, and becoming imprisoned, is a source of irritation. The seton having been introduced, it is necessary to fix it by some means, and a common one is to tie the two ends together. Thus fixed, it is liable to be caught by projecting objects and torn out, leaving an unsightly wound. A much better plan is to fold the tape into a series of short loops, and tie the end firmly round their middle. A couple of inches of tape should be left between each orifice and the knot, to allow for any subsequent swelling of the part.

The natural consequence of a seton introduced into a healthy structure is to produce a considerable amount of inflammation, followed by a more or less profuse discharge of pus. This discharge of matter will usually take place on the third day, and is more than half a day earlier in summer than in winter. They are sometimes used to produce a derivative effect in the case of deep-seated or internal inflammations, though for this purpose they are chiefly applicable when the disease is chronic, otherwise a blister is to be preferred, on account of the greater rapidity of its action. In spavin, and various other forms of lameness, they are at times employed with great benefit in the neighbourhood of the malady. Their effect is sometimes increased by smearing the seton with some irritant—such as a preparation of black helebore, turpentine, euphorbium, &c. A peculiar system occasionally employed successfully in spavin is the introduction of a thread, medicated in this way, deeply into the soft parts over the seat of the bony tumour. This is chiefly recommended by the fact that, if well managed, it leaves no blemish on the hock.

For internal inflammations, it is probable that setons possess no advantage unattainable by blisters, although we frequently see them placed in the dewlap of cattle, and in the breast and sides of the chest in horses in certain thoracic complaints.

Passed through fistulous wounds, they are often highly useful in maintaining a dependent orifice and exercising a stimulant action on the unhealthy and indurated walls of the cavity or canal. This last purpose may be still better fulfilled if the seton is impregnated with some stimulant or caustic agent.

Setons are sometimes passed through indolent tumours to effect their destruction. This they generally do by exciting inflammation, and leading to the disintegration of the tumour, which is partly absorbed, and in part degenerates into pus, and is discharged externally. For this purpose, again, the agent will often be better medicated, more particularly as caustics act much more powerfully on morbid products than on healthy structures, and can accordingly be employed with comparative safety so far as the latter are concerned.

Another common use of setons is as a prophylactic in certain complaints, and in particular in blackquarter and its allied disorders. In young cattle, they are usually placed in the dewlap, and allowed to remain for months at a time, or so long as the subjects are in a condition supposed to predispose to the disorder. For this purpose they are often beneficial at first, as the animals most predisposed to these affections are such as are thriving rapidly, and forming large quantities of highly nutritive blood; and the setons, by establishing a drain on the system, act in the manner of a safety-valve in preventing the onset of the disorder. It must be borne in mind, however, that a vigorous constitution soon accommodates itself to such a drain; and, accordingly, more blood is elaborated, and the predisposition may become as strong as before. The sudden removal of the seton in such a case would be attended with considerable danger. It is accordingly preferable to employ proper hygienic measures as regards drainage, and a liberal allowance of food, so as to keep the animals constantly improving without becoming dangerously plethoric.

In no case should the same seton be left more than a week in, as it gets impregnated with putrid matters, resulting from the decomposing pus, and may thus become irritating, or even dangerous. If it is necessary to keep up the effect for a longer time, a new tape attached to the end of the old may be drawn into the wound, and fixed as before.

ON THE DIFFERENCES BETWEEN WHOLESOME AND UNWHOLESOME AIR.

By J. A. Wanklyn,

Professor of Chemistry at the London Institution.

Davy showed, a long time ago, that the proportion of carbonic acid in respired air may be very much augmented without any physiological result. According to his experiments, as much as 20 per cent. of the atmosphere may consist of carbonic acid without injury to the animals breathing it. If anything like this amount of carbonic acid produces so little effect upon us, what shall we say of the 0·5 per cent., which is almost the highest per-centage of carbonic acid ever found in an ill-ventilated and crowded room in this country? And what shall we say of the assertion that the difference in salubrity between the air in the neighbourhood of a "midden" and the air "over North Scotland (towns excepted") is due to the circumstance that there is 0·0774 per cent. of carbonic acid in the former, whilst the latter contains only 0·0336? In a recent number of the *Chemical News* (Dec. 31st, 1864) I find an account of a paper of Dr Angus Smith "On the Composition of the Atmosphere;" and it appears from this account that he attributes the wholesomeness or unwholesomeness of different atmospheres to minute differences in the per-centage of carbonic acid. Although we meet with statements of this sort in the manuals (in Odling's Manual, for example, p. 217)—"a confined atmosphere is rendered unwholesome, not by a consumption of its oxygen, but by an increase in the proportion of its carbonic anhydride, effected by the processes of respiration and combustion,"—I cannot understand how Dr Angus Smith, who has moreover made a special study of the various states of the atmosphere, could fall into so desperate an error. And although the plain sense of the paper is, that minute quantities of carbonic acid are the cause, or part of

the cause, of the physiological differences between different atmospheres, surely he could not mean more than that these minute quantities of carbonic acid are *concomitant* with the physiological effects. And surely the utmost that Dr Angus Smith will think of maintaining will be in substance this: the deficiency of oxygen in the atmosphere of towns and of crowded rooms is so small that it can produce no physiological result; the excess of carbonic acid is also too small to act physiologically; yet this deficiency of oxygen and this excess of carbonic acid, being almost invariably found in company with the deleterious thing which spoils the atmospheres of towns and of crowded rooms, may be taken as an index to the amount of deterioration which a given atmosphere has undergone. Even this proposition, under this limitation, I call in question, maintaining that the oxygen and carbonic acid criteria are very untrustworthy indices to the state of salubrity of the atmosphere.

I will content myself with pointing out two striking absurdities which flow from the adoption of these indices:—

1st, That the air on the Alps is far more pestilent than the air in the immediate neighbourhood of a Manchester "midden," or the air of a close room.

2d, That air taken from a court-yard is one day as wholesome as air from the open heath, and the next as pestilent as that from a back street in a town.

In truth, there are many causes which determine the precise quantities of oxygen and carbonic acid in the atmosphere, and the per-centages of these two gases found in the air of a given locality are a very poor guide to the quantity of carbonaceous matter undergoing slow combustion.

Before any real knowledge of the pestilent matters which cause the deterioration of the air in towns and close rooms can be arrived at, chemists must investigate the subject in a very different manner from that which they are too prone to adopt. Just as the difference between one mineral water and another depends not upon any difference in the proportions of oxygen and hydrogen composing the water, but upon the presence of very minute traces of salts of different kinds, so the difference between the atmosphere in one locality and another is due to minute quantities of very active gases, vapours, or dust, and not to the relative proportions of nitrogen, oxygen, and carbonic acid. It is not at all improbable that the presence of minute traces of carbonic oxide (a very active poison) may have a great deal to do with the deterioration of the atmosphere in ill-ventilated rooms. But whether it be traces of carbonic oxide or of prussic acid, or of something else which are at the root of the immense physiological difference between the atmospheres of various localities, certain it is that the air of a crowded room is not bad by reason of its carbonic acid or of any deficiency in its oxygen.

LESION OF THE EXTERIOR MUSCLES OF THE FOREARM, PARTICULARLY THE MEDIAN HEAD OF THE TRICEPS EXTENSOR BRACHII, WITH SYMPTOMS RESEMBLING THOSE OF FRACTURE OF THE HUMERUS.

By M. Urbain Leblanc.

(*From La Clinique Vétérinaire, January* 1865.)

M. Bouley, junior, was the first to notice, in 1833, a frequent lesion of the flexor metatarsi, usually attended with symptoms which, on superficial examination, resemble those of fracture of the tibia.

The cases seen by M. Bouley all recovered, so that he had no opportunity of observing the character of the lesion on the dead subject, but as the section of the tendon gives rise to the same symptoms, the lesion is probably either a laceration or at least undue distension of the muscle. The cause, in every case, is violent traction of the muscle in connexion with excessive exertion on the part of the animal.

Rigot has well described lesions met with by him in certain muscles of horses lame in the hind limbs, (*Recueil*, 1827.) These were lacerations, superficial or deep according as the muscles were thin and not enclosed in a sheath, or their thick and covered by a strong fibrous envelope; sanguineous clots in different degrees of organisation, either infiltrated or encysted; discolourations, indurations, and change of form. These, however, were not met with in the flexor metatarsi. He has not met with cases presenting the symptoms noticed by M. Bouley.

M. Leblanc has often noticed the lesions mentioned by Rigot. They always diminish or annihilate the contractile power of the muscles, frequently terminating in atrophy of the muscle.

These lesions are often unaccompanied by symptoms of active inflammation, such as swelling, abnormal heat, and pain on pressure. It is well to note this, as the absence of such symptoms does not necessarily prove that there has not been muscular distension or even laceration.

M. Leblanc believes that all the published cases of muscular lesion simulating fractures have been those of the flexor metatarsi, hence he is led to notice a case of lameness in the fore extremity bearing similar characters. On 6th January 1860 a very active five-year-old entire horse, drawing a heavy carriage from the Rouen railway station, on the ice-clad streets, sustained the injury in attempting to start the load. After making a violent effort, it stopped, turned slightly to the left side, and refused to proceed. The left fore limb appeared useless, and the poor animal was walked home on three legs.

When standing quietly, the fore limb described a curve from the elbow to the hoof. The anterior aspect of the hoof was rested on the ground, the digital, fetlock, knee, and elbow-joints being flexed. The humerus was almost vertical, and the elbow low and abducted from the body.

On examination, neither fracture nor luxation could be made out. The forearm was easily flexed on the arm, no resistance being offered by the animal, and the muscular mass of the triceps was flaccid and elongated. Strong compression between the fingers and hands did not draw forth symptoms of pain, and there was no swelling or undue heat.

When walked out, in attempting to flex the forearm, it was elevated suddenly, not in a direction parallel to the body, but describing a series of very irregular zig-zags. It seemed as if the member was paralysed. When advanced, the limb was kept straight for an instant, and then curved so as to bring the toe in contact with the ground. The animal advanced his body by a kind of leap, coming down again upon the right fore foot, and each time the left leg was more curved, and the foot, the fetlock, or even the knee, are brought into contact with the ground. At first sight one would have concluded that the leg was broken, but such a conclusion was easily rectified by a close examination.

An examination of the olecranon showed that it was sound. The distortion of the triceps was particularly marked in the lower and deeper part of the muscle. As the symptoms were much analogous to those observed by M. Bouley, it was decided to subject it to treatment.

The analogies and differences between the two lesions are these:—With lacerated flexor metatarsi, the horse can maintain the standing posture perfectly, as the muscles engaged in extending the limb are intact; there is, however, the greatest difficulty of flexing the leg and advancing the foot. With lesion of the triceps extensor brachii, on the other hand, the limb cannot be kept extended so as to let the weight rest upon it, whilst it is very easily carried forward.

Nothing was done for the animal on the day of the accident. The following day there was still no pain on pressure, nor swelling. The animal lay down and rose easily. Strong tincture of cantharides was applied on the shoulder and arm.

On the 8th the skin and subcutaneous areolar tissue were tumified; otherwise, the symptoms had not changed. On the 9th the horse was carefully led to M. Leblanc's infirmary, and walked better than on the day of the accident. He had here an ample loose box and liberal diet. It gradually improved until the 4th February, when, at the request of the owner, he was killed. The depression behind the arm was daily filling up, the animal rested on the limb, and did not jerk it forward in the same way in walking.

The caput medium of the triceps was discoloured and indurated. Towards the middle of the muscle it was thinner than that on the right side; it was flaccid, and the fibres separated easily from each other. The induration was at its insertion. There was no apparent solution of continuity, nor any trace of hemorrhage or serous infiltration. The scapulo-ulnaris and caput-magnum of the triceps were similarly affected, though to a much slighter extent. The small head of the triceps was even less affected, though still distinctly implicated.

CATTLE TRAFFIC ON SUNDAY—THAMES POLICE COURT.

YESTERDAY, twenty-one licensed drovers appeared before Mr Partridge, to answer summonses taken out by Inspector Holloway, of the H division, for driving foreign cattle along the streets of the district on Sunday, the 4th of December last, and two following Sundays, in violation of the statute.

The first ten defendants having answered to their names, Samuel Rimell, John Barnard, and Philip Bradley, constables of the H division, were called. They proved that the prisoners were driving large numbers of cattle along the streets of the district from the Dublin wharf, Lower East Smithfield, to the lairs at Hackney-wick, on the three Sundays mentioned, between ten and five o'clock.

The defendants, on being asked if they knew they were doing wrong in driving cattle through the streets during the prohibited hours, said they were obliged to do so, and that the cattle must either remain on board the ships which brought them over, or be driven through the streets to the lairs, for there was no room for them on the Dublin-wharf. One of the defendants, with one hundred oxen, said, Here is my certificate from the veterinary surgeon, and that is enough.

In answer to questions by Mr Partridge, the witnesses said the cattle seemed to be healthy, and were driven over the streets at a very rapid pace. There was no room for cattle to remain at the Dublin wharf. They must either be driven away directly after they were landed, or be suffocated.

Mr Partridge said that Mr Price, the superintendent of the Dublin wharf, and Mr Kidd, of the St Katharine's Steam-packet Wharf, who represented the General Steam Navigation Company, were both in attendance. He asked them if they had any observations to make.

Mr Price said there was great difficulty in carrying out law as it stood. The proprietors and managers of the wharf did their utmost, on all occasions, to prevent annoyance and inconvenience to their neighbours and the public. Although the certificate of the veterinary surgeon, that it was necessary to remove the cattle, was in the possession of every drover, he knew that would not justify a violation of the law. He could assure the magistrate the necessities of a large and important trade in foreign cattle required that they should be landed on Sundays. Everything possible should be done to avoid complaint, and he hoped the magistrate, in the exercise of a wise discretion, would visit lightly the offences of a number of honest and industrious men who could not afford to pay heavy prices. The drovers are appointed by the master-drovers. We have no control over them. They are the deputies of the consignees.

Mr Kidd said that all the cases were from the Dublin Wharf, and that none were from the St Katharine's Wharf, which he represented. The necessities of the cattle trade rendered it almost imperative that foreign stock should be landed on Sundays. As Sir Richard Mayne, the Chief Commissioner of Police, had expressed his willingness to receive a deputation on the subject of the regulations for cattle-driving generally, he and Mr Price would avail themselves of Sir Richard Mayne's kindness and courtesy, and wait upon him for the purpose of obtaining some alterations, giving better accommodation to the trade and avoiding any infraction of the law.

Mr Partridge thought the General Steam Navigation Company, with their resources, could have avoided the driving of cattle during the prohibited hours on Sundays.

Mr Kidd.—No, Sir, we can't always avoid it.

Mr Partridge said the duty of the magistrates was simply a ministerial one. The law prohibited the driving of cattle over the streets of the metropolis between ten and five o'clock on Sundays at all, and under any circumstances, and only before and after those hours with a veterinary surgeon's certificate that it was necessary for the health of the cattle that they should be driven from the wharves to the lairs. He had nothing to do with the policy or the impolicy of the law. If it was a bad law, those whom it affected must take the usual constitutional means to effect an alteration or repeal. As long as the law existed he and his colleague must see it fairly carried out. He had adjourned the summonses that he might see the wharves for the landing of foreign cattle. Through the civility and attention of Mr Price and Mr Kidd, he and Mr Paget, his colleague, had visited the wharves of the General Steam Navigation Company at Blackwall and St Katharine's, the Dublin Wharf, and the British and Foreign Wharf. At Blackwall the General Steam Navigation Company had provided large accommodation for the landing and storing of cattle, with

slaughter-houses, and a plentiful supply of water. He thought there was room enough there for all the cattle imported into the port of London, and they could be driven to their lairs from Blackwall without passing through any of the crowded streets. He considered it a nuisance for cattle to be driven through the crowded streets of the metropolis on any day. At St Katharine's Wharf, also belonging to the General Steam Navigation Company, there was a great deal of accommodation for cattle. At the Dublin and British and Foreign Wharves, extra building and sheds were being erected for the accommodation of cattle. At present they were not ready. When completed they would be capable of accommodating a large quantity of cattle. With those questions, however, he had nothing to do. If by any arrangement all foreign cattle could be landed at Blackwall, and not be brought up the Pool to be landed at wharves in the vicinity of narrow, crowded, and inconvenient streets and lanes, without detriment to the interests of other wharfingers, it would be a very great advantage. Blackwall was nearer to the lairs than Lower East Smithfield and St Katharine's. He had been in consultation with Mr Paget, and they had resolved that, in future, not only the cattle-drovers should be summoned, but all those who employed them should be proceeded against, and the law strictly carried out. Henceforth the full penalty of 40s. would be inflicted for any offence. At present the whole of the defendants would not be fined, but ordered to pay 2s. each for costs.

A number of other drovers were then called, and addressed in a similar strain. They were ordered to pay 2s. each, and told that employers, as well as men, must be summoned in future, and the fine would be 40s. for each offence.

Mr Wilmot, of No. 19 Lower East Smithfield, complained that cattle landed at the wharves there had been frequently standing for three hours on Sundays, and other days, in front of his house. The annoyance was very great; no one could pass in and out while the cattle were there. Foot passengers were put to inconvenience, and the street was blocked up while the cattle were there.

Mr Partridge said he must refer the applicant to the police of the district.

Mr Wilmot said he had done that before. The police seemed powerless. They could not or would not act to put down a great and increasing nuisance. He made complaints at that court several weeks ago, and sought redress elsewhere, without avail.

Mr Partridge was sorry to hear it. He was surprised to hear that cattle were kept before a man's house in a narrow street for three hours. He could afford no remedy. He was there only to hear cases brought before him in a regular manner. He had nothing to do with the regulations or the government of the police force.—*The Times of Saturday, January 7,* 1865.

At a meeting of the Court of Examiners, held on Tuesday, December 20, at 10 Red Lion Square, the following gentlemen having undergone the necessary examinations for the diploma, were admitted members of the body corporate:—Mr Richard Wyer, Folkingham; Mr Alex. Floyer, Floore, Northamptonshire; Mr William Giltra, Hampstead, Middlesex.

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THE VETERINARY REVIEW

AND

Stockowners' Journal.

ORIGINAL COMMUNICATIONS AND CASES.

ON THE MANAGEMENT OF HORSES.

(*Continued from page 75.*)

In conformity with our programme, we proceed with the discussion on the management of horses generally, not restricting our remarks to such customs or requirements as apply to any one class or breed of horses.

Horses can only pay for breeding, either to keep, or for speculation, when they are so managed that a large proportion of them reach a high state of perfection, and when only few fall below average merit, and consume forage without rendering equivalent service, whatever be the purpose for which they are intended.

Those owners who keep horses for extraordinary purposes—the turf or the field—will necessarily fail to have more than a due proportion of select stock that will reach the required standard—that being a relative and not an absolute one; therefore it forms part of good management to adapt, betimes, every horse to his proper work; the animal that is pronounced worthless by one man for a given object, proves a good horse with another for a different purpose.

In so far as the choice of parent stock influences the issue, though that stands first in the order of importance, it forms, after all, but one stage in the business of breeding; and unless every step in the procedure is well understood and efficiently prosecuted, inferior horses only will be found among the produce on trial. Without good culture, the best bred horses will fail to propagate their like, any more than choice specimens of pedigree wheat can be expected to give profitable returns if sown on an unredeemed bog, or land in every way unsuited.

All experience confirms that which sound reasoning will affirm, viz.,—that horse management is not what many insinuate, a matter of chance or of luck; but, like everything else on which human intelligence and industry are employed, the return is relative to the appliances.

Some data applying to the laws of life and health are essential to the production and preservation of all species of animals, held in high

estimation for their use; and especially do these remarks apply to the case of horses, seeing the purposes for which they are required, and the trials, of endurance and other qualities, to which they are exposed.

In treating of the indispensable requirements for horses in all stages of existence, we may class these in the first place under three heads, viz.,—Air, Aliment, and Exercise; each of these in turn to be analysed and reduced to intelligible proportions.

Pure air, in free circulation, is the first requirement of the horse, from the instant of birth to his death; too much importance cannot, therefore, be attached to the question of ventilation.

Ventilation of stables, as of human dwellings, has occupied much attention, and the subject has become better understood during the present century than at its commencement. To the devotees of veterinary science is due much of the initiative influence in making the general move in the question of pure air to breathe. Professor Coleman, availing himself of the power his position gave him, made the subject of ventilation the most important of all his public services; and it is our belief, as it was stated authoritatively forty years ago, that much evidence was brought together in a short time, by observing horses, which could not have been acquired with equal facility in hospitals, or in any way where men were found congregated in large numbers.

Understood as the subject of ventilation now is, we might have refrained from going at length into it; but we draw the distinction between the question being clearly known by some, and of its being ill-appreciated and little acted on by the many.

As regards the proper measures to be taken, much difference of opinion prevails amongst even reflecting men. Then there are many who think little, and who yet are called practical managers, though by investigation it will be found, that thoroughly good horse-management prevails more exceptionally than as the rule.

When speaking of ventilation in reference to stables, two things are commonly implied and confounded under the single word—temperature and impurity of atmosphere. "Hot and foul stables" is a commonly-heard phrase, yet, though the two phenomena may exist together—viz., excess of warmth and impurity of air—it is not necessary, and only occasionally that it is so. Horses may be breathing impure air the temperature of which is down at freezing point, or be in a pure atmosphere in which the thermometer would exhibit a temperature as high as that of the animal body; in other words, a noxious stable may be twice or even thrice as cool as one that is pure; in allowing for so great a difference, however, seasons and climate must be taken into account. It is for the purpose of illustration chiefly that we adduce the example.

That there has been, and still exists, good reason for confounding hot and foul stables, when crying out against badly-ventilated stables, we admit. Stables, constructed by the ablest of architects, are often found excessively hot, and the air within highly impure; in which

case, one cause alone produces the twofold effect,—viz., the closing up of windows and other apertures where ingress and egress of air might freely go on. The number of animals in a given space will also affect the question.

That, however, which we wish to make clear is, that horses, or any animals, may and often do suffer from the twofold depressing evils, of cold and damp localities, amidst exhalations which are the constituent elements of pestilential air.

It is, of course, not for the physiological chemist or the scientific architect that the foregoing is written; there are, however, many beyond that fractional few, to whom, it is believed, it may not be unacceptable to have their attention drawn to a matter so important.

It is less our aim to go systematically into details on ventilation than to make suggestions bearing on principles to guide in the matter. Nor would prescribed rules as to the space of building necessary for each horse, and the measurement and distribution of apertures, be of much avail in this place. It is not the building of stables, but the knowledge how to use those at our command, which we are trying to point out. Therefore, when we say that open surface drainage, free use of the besom for clearing away early accumulations of dung, and that the apertures be ample, so that no offensive odour or dampness on the walls or windows is to be found, we have indicated some of the most urgent requirements. Opening and shutting of windows is not the way to ventilate stables—not that we object to air passing in and out of the windows—but it is because men in charge of horses (not through obstinacy or disobedience, but for want of knowledge) commonly open the window in the morning, by which, with the current passing through the door, and horses moving out and in, and the stable kept clean, the air is sufficiently pure; but when evening comes men feel chilly, and many of them have vague and mysterious ideas about *night* air, and therefore let as little of it enter the stable as possible; accordingly the windows are closed, and the poor horses are shut up to breathe an atmosphere over and over again for eight hours and more, during which time we have an exhausted condition of the air for respirable purposes, every atom of it having been brought many times in contact with the lung-cells and the pores of the skins of the animals. Therefore we always want open spaces for the free circulation of air in stables; and whenever glass windows stand in our way, and the means of opening are wanting, we clear the passage by breaking a sufficient number of panes for the requirement.

The sound precept reminding us that all extremes should be avoided, has its application in the case under consideration; as regards horses, this subject of ventilation has been treated in a great measure as if any amount of exposure to the open air may be borne by the horse with impunity; by which doctrine, and its application in practice, evils in a twofold direction have resulted;—in the first place, much harm to horses by exposure; and, secondly, by endea-

vouring to enforce the adoption of irrationally-entertained notions, men refuse to follow the instructions, and therefore the required reform is obstructed, because it was not presented in a right, practicable, and well-defined manner.

We have one word, peculiarly English, which, when treating on this subject, is sufficient to leaven a large volume,—that is, "Comfort." Horses, like men, require to be made comfortable; and when we see a horse confined to a limited space, with little room to move, and no choice of cover and protection from cold, we regard his case somewhat like that of a man who is made to sit in the village stocks.

Language is seldom more perverted and abused than when men inconsiderately speak of nature or of following her; under such cover, the most preposterous things are said and cruel actions prompted.

We in England, or those in other parts of civilised Europe, can hardly conceive the true state of a horse in his natural and free liberty. It is easy to understand the state of smaller animals, whose wants are readily supplied, both of food and shelter; but the horse differs as much from these in design and wants, as does the elephant from the giraffe. The horse likes warmth and dry ground; and that which instinctively the animal selects and rejects, is found in practice, as might safely have been taken for granted in theory, to be most congenial to his system, or noxious, as the case may be.

Men devoted to field-sports, besides being the chief cultivators of the breeds of horses, are also, to no inconsiderable extent, the owners of all descriptions of them; and it is often surprising to observe how profoundly some gentlemen study the natural history of the game they hunt; whether in pursuit of a fox or a fish, the whereabouts of the game is reckoned on according to the state of the weather. As the huntsman rides to cover on a windy and rainy morning, he tells his gentlemen that he shall draw in a different line of country to that which had been the day before fixed on, because the woods then contemplated are not sufficiently dry and warm to shelter a fox in such weather, therefore he tries the sheltered hillside or plantation. Meanwhile it seldom occurs to those sportsmen, so thoroughly cognisant of the facts in the case of the fox, that the laws of nature, and the sentinels which instinct establishes, are all-powerful and peremptory in the horse; and that, by violating these, great injury is done to that animal. While the fur-clad fox and the hare can make choice of a retreating place soft and dry, if we look how the horse fares, we shall find him very differently circumstanced; confined to the bleak field or paddock, may be a shed, or even the spacious box of a few yards in diameter, with its cold brick or stone wall, and the naked tiled roof; to compare the horse under any of these conditions with other animals, small and great, and nature's freedom, is a negation of nature's privileges, and such custom is in violation of nature's laws. Horse managers may go with profit to the Zoological Society's unrivalled establishment in the Regent's Park, where, rationally and scientifically, each species of animal is kept as its natural habits re-

quire. While young horses are exposed to the rain and the wind, with their feet perpetually in a quagmire, they are in a condition which in nature's free state they would be exempt from, as much as the sleek fox; and if we look at the adult horses in use, while many are pampered and clad under two or more suits, let them be stripped, and we find them clipped, singed, or shaven as naked as an unfledged rook, and almost as ill adapted to be exposed to the ordinary weather encountered in everyday work.

(*To be continued.*)

Influenza: Being the Substance of a Paper read before the North of England Veterinary Medical Association by the Hon. Sec., Mr G. ARMATAGE, V.S. to the Right Hon. the Earl Vane.

"A PROTEAN disease!" Such is the term employed to denote the character of that affection usually—and for a considerable number of years past—known by the title of "Influenza," an Italian word signifying "*influence.*"

In whatever light the tendencies of our Veterinary Medical Association may be viewed, no higher standard of efficiency and usefulness can be claimed for it than under its present constitution,—the bringing together of the members of one profession, men almost of every shade of opinion,—all uniting with one common impulse, energy, and design, to fathom the impenetrable depths and mysteries of such diseases as that I propose to illustrate for present consideration; and no occupation can be more ennobling to any community that shall undertake such pursuits, in which mankind in general shall reap a corresponding share of the resulting advantages and reward.

A long pull, a strong pull, and a pull *altogether*, and we reach the haven of our desire.

It is not my intention to occupy your time with any critical disquisition on the history and ravages of influenza, as it has occurred during the past one hundred years; suffice it, then, to state, that the disease occurred with more or less malignancy as early as 1733, and has continued at intervals of longer or shorter duration up to the present time.

For a complete description of these outbreaks from the time above named to the year 1840, I must refer you to the fifth and ninth volumes of the *Veterinarian*, and the treatise on influenza by Mr W. C. Spooner, M.R.C.V.S., Southampton.

For the past thirty years we may trace its destructive effects upon our horses; cattle and sheep even in some instances not escaping,—at one time assuming the mild form of a catarrhal affection, terminating in others in typhoid pneumonic, pneumo-enteric, or malignant pustular and gangrenous disease; hence the denomination "Protean disease."

By many writers it appears under the ambiguous title of "epidemic catarrh;" and from its virulence at times, and under particular circumstances, as "malignant epidemic." With the exception of the characters as signified by such terms, English authors have hitherto been comparatively silent with regard to this disease, or otherwise have not given to it that important place which its nature and tendencies call for.

Percival, who left the affection altogether unnoticed in his lectures, treats of it in one part of his work on Hippo-pathology as "bronchitis, or influenza;" and under the head of Fevers, in vol. i., gives it a place under the recognised title; but from the short account there given, extending over six and a half pages, while thirteen and a half are devoted to the consideration of "strangles," immediately following—a disease by no means considered a fatal one—we may reasonably imagine that the specific characters attributed to it in these days had not then become permanently recognised.

Youatt calls it "catarrhal fever," "distemper among horses and cattle;" and with White, the writer on cattle pathology, confounds "epidemic catarrh" in the bovine species with "murrain," or "vesicular epizootic."

Blaine speaks of the "epidemic catarrh" of horses and cattle, but appears to have noticed one form only of the complaint.

Our continental brethren, who have had a full share of its ravages, appear not to have been so well satisfied with the term as ourselves, and have described several forms.

There are several points with regard to this affection which I wish to adduce for consideration, reserving others of a minor character for being dealt with in the discussion which is to follow:—

1. What is the nature of influenza?
2. What are the causes, proximate and remote?
3. What is the treatment necessarily indicated by these considerations?

First, then, the nature of influenza.

Professor Hering enumerates three distinct forms—the Catarrho-rheumatic, Gastric or Bilious Rheumatic, and the Gastro-erysipelatous.

In our own country, however, we have not been able to draw the line of demarcation so closely, symptoms which constitute the whole being more or less mixed upon each attack; though differences have been noted of various outbreaks which characterise the affection as partaking of special predominating tendencies.

During the autumn and winter of 1854, and spring of the following year, a great number of cases came under my observation and treatment, exhibiting all the characters of a gastro-rheumatic nature, extreme cases only partaking of the pneumonic complications; for an account of which I refer you to an article furnished by me to the *Veterinarian* in July 1855. In the January number of that journal for 1856, an account of the same affection is given by Mr. B. *Cartledge;* and further observations on influenza noted by myself in

the March and April numbers for that year, which specify the particular symptoms demonstrative of the disease. Subsequently to the publication of these memoirs, viz., in the following winter, and spring of 1857, the same disease exhibited ophthalmic and erysipelatous complications, which proved in most cases of a very troublesome character.

Percival, at page 147, vol. i. of the work already referred to, considers this malady "*specific*" in its nature,—"that is," says he, "a disease of a peculiar kind," as deduced from the facts that—

First, Because it breaks out at particular seasons, raging more in some localities than in others.

Second, Because it is less under the power of remedies than common fever.

Third, Because of its variety of combinations, which remove it wholly from simple diseases.

The term "specific," as applied to influenza, appears to me to consist principally in the strange tendency or predisposition towards a rapid and early appearance of debility, accompanied by a strangely peculiar sensitiveness to certain medicaments, while to others the system is altogether incapable of response; and even with regard to these, certain stages of the affection have been known to effect a complete reversion of the phenomena usually attendant upon their administration.

That excessive prostration of all vital powers which so rapidly follows upon the track of the proximate symptoms, evidently arises from the arrest placed at such an early period upon the organs of assimilation. Nutrition is thus wanting, and materials of a highly elaborate character which should be formed, specially adapted to the maintenance of those functions essential to life, those of the nervous system, are but scantily developed, and at best but as most inferior productions as far as purity is concerned. This in turn failing to supply the requisite demands of organs dependent upon the sensations for all that constitutes action, that great distributor gives as it receives—enfeebled life—receiving less and giving less, its own share contributing in no small degree to its special and perfect destruction.

Vascular engorgement, and its inevitable result,—serous effusion through the dilated, stretched, and thin coats of weakened and inactive blood-vessels, lacking their proper stimulus, occurs at a quickly succeeding epoch; and in proportion as it takes place in parts of importance must we expect the natural functions to be additionally disturbed, suspended, or even totally arrested.

I look upon "influenza" as a disease induced in the "appropriative and eliminative systems,"—disease of those wonderfully elaborate structures which are occupied in the production and appropriation of nervous energy, animal heat, &c., and perpetuation of those forces so essential to the whole which we denominate "vital;" and also those which are delegated to the equally necessary and important office of secernation.

Can we wonder, then, that nervous power should decline? that animal heat should be no longer formed, when materials for their propagation and support are not furnished?

Can we feel surprised that blood should become impure when organs for its purification,—by separating from it the unsound and deleterious elements,—are denied the power of action, nervous and structural?

And can we feel bewildered when serious complications take place as an inevitable result of the perversion of all those wondrous functions?

Disease of these minute structures I consider to be caused by a morbid ferment introduced within the circulatory system, by which vital force is moré or less withdrawn; and hence we have impeded circulation throughout the whole capillary system, vascular engorgement, suspension of the formation of all essential vital principles, sudden prostration, passive effusion without the power of becoming organised, internal combustion is not proceeded with, and excretion of all effete and hurtful products contemporaneously arrested,—the whole combining in producing within the system causes which are specially exerted towards its own destruction.

Post-mortem appearances fully justify the conclusions arrived at, and treatment successfully pursued in accordance with inferential deductions perfectly ratify their soundness.

I will not trespass on your time by an enumeration of the various symptoms,—an unnecessary proceeding in this instance,—and therefore pass to the second portion of our subject.

Second, What are the causes of influenza?

These may be enumerated thus:—

First, Proximate—a low, weak, and vitiated state of fluids and solids; inertia of the vital powers; and total absence of all conditions which destroy parts, or the system, by violent and powerful actions, induced by continued exposure to some or all of the following:—

Second, Remote causes. These may be further subdivided into—*a.* Predisposing; and *b.* Exciting.

a. Predisposing.—Hereditary taint; ill-conditioned, badly-drained, and ill-ventilated habitations; insufficient food, or of questionable quality; with other causes which tend to reduce the tone of the system, as the indiscriminate use of cooling or purgative medicines; hard work long continued; and in conjunction with the above, the process of depilation; imperfect mastication on account of defective molars; and subjection to diseases previously of various kinds, as strangles, colds, pneumonia, bronchitis, &c.

b. The exciting causes are doubtless some of the above in excess,—exposure to extreme states of temperature suddenly; subjection to an atmosphere charged with morbific matter thrown off from animals severely affected; the influence of easterly cold winds, other atmospheric conditions, and peculiarities of a profound and delicate nature too subtle for recognition by ordinary sense.

Influenza I believe to be decidedly contagious, particularly in advanced pneumonic stages; and I am inclined also to the belief that the disease has in no measure differed at the present period, in its material characters of a malignant typhoid and variable type, from those outbreaks of which we read as having occurred thirty or forty years ago, excepting, probably, that it has not been so prevalent, a result of the adoption of better understood principles of feeding, housing, and ventilation, &c.

Third, What line of treatment is necessarily indicated by these considerations?

To this I would reply, briefly—That which soothes, supports, and raises the prostrate vital powers; not violent and powerfully exciting agents: these must be strictly avoided. Pure air, even temperature, warm clothing, quiet, and seclusion, with an earnest attendant trained to implicit obedience, and well-directed domestic treatment, and half the means of cure are already in the hands of the veterinary surgeon.

By soothing, supporting, and stimulating treatment, I would imply the effects derivable from the employment of such agents as the Acetate of Ammonia, the Aromatic Spirits of Ammonia, and the Sesquicarbonate in the solid form. These being used in conjunction with Belladonna or Hyoscyamus extract, prove very useful in reducing the frequency of the irritable and weak pulse of this disease, while correspondingly the nervous energy is restored and strengthened. Ammonia, in its various forms, has proved a priceless agent in my hands; and when combined in the solid form, with the Pulv. Scillæ, and Ext. Bellad., given two or three times a day, the most irritable cough, defiant though it be, has rapidly given way; besides the relief experienced by the conjested lungs and membranes of the respiratory track.

Precursory diarrhœa is best treated with Ol. Lini, and Tr. Opii, with Ammonia in one of the forms. Gastric irritation will also be benefited by relieving the bowels, for which I have preferred the oleaginous dose with Ammonia and the extract, viewing this form of complication more as the result of reflex nervous action than absolute impaction. Mr Gamgee recommends Cape Aloes; these I have not used; but of Barbadoes Aloes and Opium, except in the first stages of diarrhœa, have always produced with me greater harm than good—the former by their peculiar nauseant and depressant effect, and the latter by its influence on the brain, if repeated,—an effect not desirable in this affection.

Ophthalmic-Rheumatic and Rachialgic complications, I have treated successfully with Potassii Iodidum, and Potassæ Nitras with alternating doses of the Ammoniæ Acetas, when the symptoms appeared to call for its use.

Blisters, rowels, and setons I have condemned as barbarous and unscientific in this disease, never having witnessed real good from their use.

Anasarca will require in some instances scarification, and the use of mild diuretics, externally as well as internally. The former I

have found of extreme benefit—when applied in the way about to be described—to horses in which the appearance of a permanently enlarged limb would prove of great detriment to appearances.

The leaves of the Folium digitalis are used as a strong infusion, with the carbonate of soda, made by pouring boiling water on both in a pail—three or four ounces of the former to half a pound of the latter—and when cool applied by means of a bandage, kept constantly wet, by being poured from the top in small but oft-repeated quantities.

The condition of the circulating fluid is also a question which concerns us much. Having lost its floating medium, by effusion more or less into various parts of the body, we must endeavour to compensate for it by the administration of such medicines as will act with special direction in this particular. I have used the Potassæ Bicarbonas, Sodæ Hyposulphis, Ammoniæ Carbonas, &c., with peculiar advantage, and which would be further manifest a hundredfold when the returning appetite allowed the consumption of swedish turnips, carrots, cabbage, clover, and such edibles, with hay-tea as drink; these articles containing the very elements of which the sanguiferous system were utterly destitute, and particularly needed by the whole frame, to insure the life of the animal.

Another question in connexion with the vital fluid, the blood, which demands important consideration at our hands, is the propriety of bleeding in influenza. My own belief is, that the proceeding is unwarrantable and uncalled for; the quickly succeeding weakness of extreme characters being alone a sufficient reason for its avoidance. To preserve the quality of this fluid is to preserve life in this disease; and to remove it from the system, we do not include the real cause.

Absolute purgation is equally reprehensible.

Transfusion, in extreme cases, and the employment of some of the Phosphates and Sulphites, are courses open to our consideration.

Such is an imperfect outline of my ideas in reference to this most destructive disease; much more might have been said; indeed, the subject is inexhaustible, and concerns us much; but I have endeavoured rather to provoke thought and discussion, than to be minute in descriptive detail, a course more in keeping with the objects for which we are met.

Minor details of the nature, causes, and treatment of influenza, are purposely omitted from these propositions—debate must fill up the space.

Thoughts in the Sick Box—"Influenza." By THOMAS GREAVES, M.R.C.V.S., Manchester.

THERE is perhaps no disease which presents to the close observer more deeply interesting phenomena than those developed in a patient as influenza proceeds through its various stages. The diligent inquirer cannot be a witness, and permit them to pass without contemplating them, and endeavouring to glean from them some useful knowledge which can be turned to advantage in succeeding cases. This disease has been very prevalent lately in many of the large towns and cities of England, and in some places has been attended with great fatality; and I look upon it as a duty of every professional man to contribute whatever knowledge he can for one another's good; and it is to me a source of great consolation to know that the veterinary surgeon of the present day is so much more competent to combat it, and consequently to save many lives which would have been sacrificed in the days of our forefathers. Still, we are yet far from comprehending fully the true nature of this malady; but, I presume, all men ere this are satisfied of the vital importance of fresh cool air, diffusable stimulants, vegetable and mineral tonics. I also presume that no man now-a-days bleeds or purges in this disease; but I am bold to believe that there are still many scientific physiological questions concerned in this disease which have not received that full investigation which, I think, their importance demands. And since science does not shun light, or affect mystery, nor does it trade in ignorance or cupidity, I am anxious to stimulate thought, and to arouse inquiry, upon some of these points, which I conceive should be better understood by us than they are at present. I will endeavour to show what I mean by putting three questions.

Firstly, What is the first and real cause of the disease, and the exact *modus operandi* of attack?

Secondly, What is the clear and correct explanation of the debility?

Thirdly, What is the small pulse dependent upon?

To say, "Influenza is, like many other epidemics, referable to some putrescence or deleterious state of the atmosphere; that it is imbibed into the system during the process of respiration; that it produces a certain mystical effect upon the nervous system, thereby prostrating the vital powers," is, to my mind, a very ambiguous answer—a very inconclusive hypothesis. The information I want is more definite—more self-evident. We see the exhaustion; but in what manner has that effect been produced? Let us not evade, but try to unravel these questions. We see, in a few hours after the attack, the restlessness in the legs and feet, the general lassitude, the eyelids so swollen that the eye is completely closed up, and constant weeping; in some bad cases a discharge of positive pus from the eyes, and blindness for many days. In some cases there are malignant pustules and extensive desquamating, sloughing about the jaws or legs, or an

inveterate discharge from the nostrils, simulating glanders; pulse, for the first or second twenty-four or forty-eight hours, 88 or 100 per minute; but small, almost too little, too feeble to be distinctly taken, even with the utmost care, and with the greatest nicety of touch, an almost *bloodless pulse.*

Generally speaking, influenza is an ephemeral disturbance, and where proper treatment is resorted to, is only occasionally fatal. I have had a goodly number under my care during the last two months, and my treatment has been attended, upon the whole, with satisfactory results. In one stable of sixty-five horses, perhaps the largest and best cart-horses in the city of Manchester, thirty-five of them have been attacked; the pulse of twelve of them reached 88 each, and five touched 100 beats in the minute. Of these, every case was successful. In two other stables, one thirty-eight and the other forty-two horses, almost every horse was attacked. In these stables I was not quite so successful. I experienced considerable difficulty in consequence of the ventilation in these two stables not having been properly carried out. Out of these two stables I had from time to time two at once, seventeen or eighteen of the worst cases brought into my own loose boxes, and their heads tied to the open door, paying constant attention to keeping the ears and skin of a natural temperature. In each of these cases they seemed to be at a standstill, eating nothing, pulse 88 or 96, and I could make no progress with them in their own stables; but no sooner had they got into my boxes than they began to improve. They seemed to take a turn, and in two or three days their pulse came down to 40 or 44. Their appetite returned, and they went to their own stables convalescent. This result was the same *in every instance,* and under precisely the same medicinal treatment, viz.—medicines to disperse the tendency to congestion, and give increased vigour, such as Spts. Nit. Ether., Tinct. Piment. in draught, or Ammon. Carb., and ginger in ball. In some cases of universally thick coat, I clipped with magical effect. But more than this, and I invite particular and serious attention to this fact, viz—that in every case the pulse was found to have got up eight, twelve, or eighteen beats per minute on the day after they returned to their own stable; but having got over the crisis, they continued to eat and improve. I look upon these instances as proof positive of the good effects of fresh air. I had in these stables coke fires, constantly burning day and night, and immovable grates. I have seen only one case of second attack; it was in an old horse, and he died. I have seen no clear instance of an affected animal propagating it to a healthy one. I made a *post-mortem* examination of the above horse, and other old horses that died of influenza. In these cases I have found effusion into the chest or pericardium, and this, to all appearance, without having been preceded by any inflammatory action. In no case have I employed mustard or blister to the sides or breast; but I have attended *post-mortem* examinations of horses which have died under the treatment of other practitioners,

where mustard and blister to the sides, throat, and breast had been employed, but all in vain. And in such cases I felt constrained to form an opinion, that if pure fresh cool air had been supplied from the first, and the counter irritation had been wholly omitted, they would have lived to face the storm again. I have also examined horses where neither immaturity nor senility favoured the complaint, and where all the vital organs were free from disease; but in *every instance* I have found the *heart affected,* and I beg to call particular attention to this fact, viz.,—that one ventricle of the heart contained black coagulum by itself, and the other ventricle contained lymph by itself. In other cases, the two component parts of the blood had separated, but were coagulated, and had collected in one or both ventricles. Now, I am of opinion that this state may exist to a certain extent for many days prior to death, and further, I am of opinion that it is possible for it to be wholly removed; but whilst this clot exists in the heart, be it ever so small a body, it will produce in exact ratio an inability in the heart to perform its natural functions. It interferes more or less with the action of the tricuspid and bicuspid valves, impeding the blood in its transit. Hence the debility and exhaustion of the vital powers. There must be a diminished, if not suspended, vis a tergo, hence the *small pulse.* I feel convinced that every horse that dies of *pure influenza,* dies from *sinking* and *syncope.* And I can readily conceive the nervous debility of the heart being such that it cannot acquit itself, but is struggling and struggling on, beating upon the same charge of blood over and over again; the heart being too feeble effectually to empty itself in its action, until at length it becomes tired out, and nature sinks from sheer exhaustion, and in this manner the flickering wane of life flows on tremulously, just as it is about to be ingulfed into the vortex of death. There may be some who will dispute my conclusions. I want some one to do so, and enable me fully to comprehend the nature of this

"*Clot of blood in the heart.*"

It may be said it is a natural sequence; but in this they would be in error. I have examined numbers of hearts, and it is nearly always found in cases of sudden deaths. This day I have spent two hours in the knackers' yard, and have examined eight hearts of horses that have died, I was told, of "influenza." The appearance of this coagulum differed in different hearts, but in all it was there. I am aware when blood coagulates slowly and settles of itself, whether it be in a vessel or a natural cavity, its constituents separate in accordance with the laws of gravitation and a loss of cohesive affinity, and in such cases the lymph is uppermost, and has the appearance and consistency of jelly, and is of a straw colour. But the appearance of the blood in these ventricles showed it had been agitated in the cavity for some considerable time, and that the valves and cords of the valves had acted like an egg whisk; the fibrine of the blood had become attached in considerable quantities to the cords and valves, assum-

ing the character and appearance of fibrous matter. No doubt, admitting of an escape back of some considerable quantity of blood each stroke. Of this I am certain, that the blood can separate in the body during life. I had an instance of this last summer—a case of pneumonia, aggravated by some hemoptisis. After death, one lobe of the lungs was found to be tumefied, and was twice the size and three times the weight of its fellow. Eight or ten ropes of coagulated blood had percolated into the air-passages or air-tubes, eight or ten inches long each; some of them were pure straw-colour lymph, and the others pure black particles; they had acted like so many sticks or foreign bodies thrust into the lungs. Hence the tumefaction, the other lobe being free from disease.

Whether this condition of the heart, which I have now called attention to, is a cause of that state called "influenza," or is simply a result of functional derangement, or some peculiar condition of the blood, I should be anxious to see cleared up. Since, if it is a cause, how satisfactory it would be to know assuredly that nature can remove such obstructions in so vital an organ.

Veterinary Records.—By G. Armatage, V.S. to the Right Hon. the Earl Vane.

IMPROVED PORTABLE BALLING IRON.

I forward sketches of an improved Portable Balling Iron, which I designed about ten years ago. Carried in a leathern bag, attached to the side of the saddle behind the flap, it has proved extremely useful in many cases of emergency, when the mouth of a colt, &c., has required examination, and a balling iron would not have been accessible. Its general character may recommend itself to those who do not believe in loading their pockets *too full with too many things.* The properties claimed for the instrument are portability and applicability. The weight is only a few ounces, forged out of the best Low Moor iron, easily adjusted in a couple of seconds, perfectly secure when between the jaws, extremely simple in its construction, and not likely to become disarranged when the parts are fitted with accuracy.

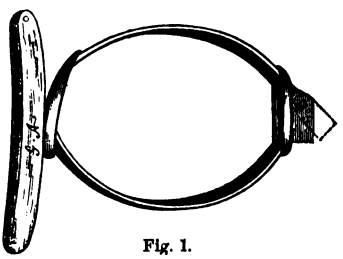

Fig. 1.

Fig. 2.

Fig. 1 represents the iron adjusted for use.

Fig. 2 the same when closed for the saddle-bag or pocket.

A brief description will not be altogether unnecessary.

The ring which admits the hand is composed of halves, the upper one being continuous with the elbow, turned up on the left, and a stud on the right.

The lower having two buttons, one at each end, and a nick or channel groove, into which fits a keeper or staple, riveted upon the upper half, allowing the lower to be turned round; the long arm on the left being turned down, secures the button on that side, and a box shackle, with movement shown by the dotted lines, on the opposite, holds that of the right; the whole being held firmly in the left hand with the tongue when in use, is perfectly secure against closure from pressure by the jaws.

I may state that I have had one in constant use since first designed and made. My friend, Mr W. B. Taylor, M.R.C.V.S., Anston, near Rotherham, who also has had one a similar length of time, speaks of it with the highest satisfaction, both being at the present time as perfect as when executed.

PREPARATION OF PINS FOR CLOSURE OF WOUNDS.

(*By the same.*)

To those veterinary surgeons who are in the daily use of pins for the closing of wounds, I need not point out the extreme difficulty which often attends the passage of these useful agents through the skin in various parts of the body, such as the hips, knees, &c., &c.; many attempts to effect which are frustrated by the bending, which succeeds to the required pressure; the fingers become sore when any number are required, and the patience of the animal well-nigh exhausted.

To obviate the resulting inconveniences various remedies have been adopted, amongst which may be mentioned Sharke's Pliers for holding the pins or wire while they are being passed through the lips of the wound; and, as far as appearances go, we are justified in saying the instrument certainly appears to have been executed by a first-rate artisan, and possesses all the characters of a very neat production.

Another device, which has the recommendation of Mr Haycock, in his treatise on the "Principles and Practice of Veterinary Medicine and Surgery"—a drawing of which is supplied at page 107 of part 1st—consists of a kind of bodkin, supplied with a groove for the pin, and mounted in a handle raised from the line of the blade by a crank or double elbow. Having a fine point, it is intended to be forced through the skin, the pin being passed down the groove before it is withdrawn.

The old pin-director differs from the above in being devoid of the

double elbow,—that is, perfectly straight, and is a very awkward instrument.

Besides these, there are other articles of necessity required, such as cutting pliers, which are either exhibited in a form merely for the purpose of snipping off the points of pins, cutting through suture wire, or otherwise are attached to a pair of large fleams; and have little else to recommend them but the fact of their making one among a pregnant case of instruments, and uselessly adding to its weight.

The pin-directors, in my estimation, savour too much of the *shoemaker's awl,* which I have permanently discarded from my case. The pin-cutter I obtain from the curved scissors—which always form an accompaniment to all well provided pocket-cases—a notch being filed across the edge of each of the blades, high up in the throat, holds the pin, and cuts through it with the greatest ease. The pins I prepare as follows :—

A piece of inch-square steel, the upper end of which is filed or faced up perfectly flat, and the lower drawn to a point for fixing in a piece of hard wood, (Fig. 3,) has a notch filed from the edge towards the centre, with a small triangular file, corresponding to the thickness of a pin; this is afterwards hardened, and placed in a suitable position, as in a vice or piece of wood. A pin is placed in the groove, and struck with a small hammer, then turned one-third round and struck again, which has the effect of giving a triangular or three-square point to it. Every one knows the greater ease with which a needle with such a point, or a flat one, enters the skin,—a property which each pin acquires under the proceeding described, and completely obviates the use of pliers or directors of any kind.

Fig. 3.

To prepare all kinds of pins in the manner described it will be necessary to have at least three grooves cut into the stake, varying from a carpet pin to that in use among dressmakers, &c.,—a supply of which, with some soft twine, and the elbow scissors in the case, the practitioner is ready at all times to face the most extensive wound which admits of the application of sutures.

The Veterinary Review and Stockowners' Journal.

PLEURO-PNEUMONIA IN CATTLE.

THE ever-recurring outbreaks of this disease, denied by those who fear the adoption of any proper measures for the arrest of contagious disorders, deserve to be specially noticed at this period. Rarely have the manifestations of this disease in town dairies and on farms been more numerous and severe in certain districts than they have been of late. Our own investigations prove that few of the lots of foreign cattle purchased during the past year have escaped decimation; and since Mr Robertson's statement appeared in our last we have received information of wholesale destruction on several farms where foreign cattle have been wintered. One farmer said that he might lose half before clearing off the remnant in hand, which is at present in good condition; and that owing to the small price at which the animals had been bought, and the sums realised from butchers for the diseased ones, he would not lose much, if anything, by the transaction. Another farmer, similarly circumstanced, was recently threatened with prosecution for permitting his infected stock to rest by the roadside, and remain where the cattle of his neighbours might catch the disease. And the third has lost heavily, but, as usual, keeps the secret. In the last instance, an additional reason for secrecy is to be found in the fact that the loser has been strenuously opposed to any measure of reform in relation to the diseased cattle traffic. We know of one instance where a large holding was recently stocked with a numerous herd of cattle, by ten distinct purchases, and every lot bought proved to be diseased.

The most superficial observer cannot fail to be struck with the effectual manner in which farmers shun publicity concerning the prevalent outbreaks. This they accomplish by getting rid of their diseased cattle, by means which they only seek to justify on the ground that remedy is hopeless, and the butcher is ever ready to

buy. It is also much to be deplored that secrecy is purchased at a dear price to the farmer, as no rational means of prevention have been adopted. We are prepared to demonstrate that on farms, and especially amongst feeding stock, prevention is usually easy and certain; and it is much to be desired that the agricultural societies, and, if necessary, Parliament, should adopt means for demonstrating to the country at large that even so insidious and fatal a plague as pleuro-pneumonia can be controlled in its progress by the adoption of means which are both inexpensive and pre-eminently successful.

The opposition we have met in advocating the interests of stock-owners, and of the public at large, can in no way deter us from prosecuting the subject to a successful issue. Those who cannot, or will not, yet see the good which must flow from the adoption of all measures calculated to limit the spread of contagious diseases, must sooner or later become converts to views which are acknowledged as sound, wherever cattle plagues have been properly studied. It is a lasting disgrace to our profession that some of its most influential members have sided with the least enlightened of the cattle-rearers of this country; and never can it be forgotten that nearly a quarter of a century has elapsed since the introduction of the lung disease, without the institution of proper inquiries and experiments for the extermination of a murrain which should be, as it once was, entirely foreign to the British Isles.

CLIPPING SHEEP IN WINTER.

On Saturday, the 18th of February, a sheep salesman appeared at the Clerkenwell Police Court, to answer to a charge of having cruelly ill-treated sheep by exposing them in cold frosty weather when newly shorn. In drawing attention to the report, which we publish in the following pages, it is important to state that for several years past serious complaints have reached us of the very objectionable practice of exposing newly-clipped sheep to the severe frosts of a winter season. The love of money induces men to inflict great cruelty on the lower animals in a variety of ways; but we cannot adduce instances of greater barbarity than those, of which a fair instance was exposed at Clerkenwell, before Mr D'Eyncourt. It is needless to comment on the practice of shearing in the dead of winter, with the thermometer far below freezing point, and the animals shorn pre-

vented even the chance of moving to and fro, to keep up a certain amount of animal heat. There should be no compromise in these cases henceforward; and if the farmers or dealers find it very profitable to send forth sheep to market without wool on their backs, warm coverings should be provided for them, to be applied so soon as the fleeces are shorn. As, however, people cannot be trusted to deal with animals thus humanely, there is no doubt that great attention should be paid to the subject by the Royal Society for the Prevention of Cruelty to Animals.

PRIZE ESSAYS ON THE DISEASES OF ANIMALS.

We have on former occasions drawn attention to the fact that veterinary surgeons overlook the inducements offered them by agricultural societies to write on subjects specially suited to them. Farmers, medical men, shepherds, and others, carry off prizes which should at all events be competed for—and doubtless they would with success—by members of our profession. We are happy to learn that Mr George Armatage, veterinary surgeon, Pensher, has been awarded a prize by the Highland and Agricultural Society, for an essay on the foot and mouth disease. The same Society now offers further premiums for Reports; and in the list published, we notice that a gold medal, or ten sovereigns, will be given for the best Essay on the Diseases of Farm Horses. The subject is too vast and comprehensive for an essay of moderate length, and the prize is small; but as the Reports need not be of an exhaustive character, many might write much, and well, even on diseases of farm horses in general, with profit to themselves and others, for the simple honour of getting a gold medal. We deem it our duty to urge our readers to devote some attention to competitions which too often pass over unheard of for want of being referred to in veterinary periodicals.

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE Annual General Meeting of this Association was held on Friday, January 20, at the Crown and Thistle Hotel, Newcastle-on-Tyne, a considerable number of members being present on the occasion.

Mr C. Hunting, President, in the chair.

The Secretary's report showed a satisfactory state of the Society, financial and otherwise, and was unanimously adopted, on the proposition of Mr W. S. Moore, seconded by Mr J. Fairbairn.

Mr Womack, Ponteland, Newcastle, and Mr R. Hall, Stockton-on-Tees, were admitted members of the Society.

The following gentlemen were chosen to fill the respective offices during the present year :—

President—Mr C. Hunting—re-elected.

Vice-Presidents—Mr John Fairbairn, Alnwick; and Mr G. Farrow, Durham.

Council—Mr H. Hunter, Newcastle—re-elected; Mr Thos. Thomson, Sunderland; Mr Luke Scott, Hetton-le-Hole—re-elected; Mr W. S. Moore, Gateshead; Mr D. Macgregor, Seaton Delaval; Mr John Hutchinson, South Shields—re-elected.

Treasurer—Mr D. Dudgeon, Sunderland—re-elected.

Hon. Secretary—Mr G. Armatage, Pensher—re-elected.

On the motion of the Secretary, seconded by the President, and carried unanimously, it was resolved in future to hold the quarterly meetings alternately in Newcastle and Durham, or other towns in the counties of Durham or Northumberland, as may be decided by a majority of members present at the previous meeting. In accordance, therefore, with this arrangement, the next meeting will be held at Durham, during the month of April.

On the conclusion of the business proceedings, the Hon. Secretary read a paper on "Influenza," which gave rise to an extended and profitable discussion, remarkable for the spirit of inquiry and desire to impart the fullest information on a subject of such importance, in which most present took part.

A well-maintained discussion ensued, in which the majority of members took part.

The use of rowels and setons were advocated by Mr Thompson, who stated his reasons for their preference at some length, to which, however, the views of those present did not subscribe.

The principle of blood-letting did not meet with favour; a highly nourishing, sustaining, and stimulating plan of treatment being principally advocated. The remarks of Messrs Farrow, Stephenson, Dudgeon, Fairbairn, and others, were worthy of high consideration, as being reliable on account of practical bearing.

The essayist briefly replied to the various conflicting arguments, and afterwards the President disposed of the proceedings by his usual

appropriate manner of summing up the various inferences to be drawn from discussions of this character; which was succeeded by a vote of thanks being warmly accorded to each of these gentlemen for their offices on the occasion.

The next quarterly meeting will be held at Durham, during the month of April.

Mr Dudgeon and Mr Farrow drew the attention of the meeting to interesting cases which had recently fallen under their observation; that by the former gentleman being illustrated by the first rib of a horse fractured obliquely across the middle, from a fall after a false step, with a load, on the highway. The latter produced about two pounds of the spray of rifle bullets, which had been taken into the stomach of a cow, which, with others, had died from their effects, having been picked up by the animals when grazing on ground used for rifle practice.

The members and their friends afterwards dined together, the duties of the Chair being efficiently performed by the President, (Mr Hunting,) and those of the Vice devolving upon the Secretary.

The President proposed "The Queen, the Prince of Wales, and rest of the Royal Family;" "Army and Navy, and Rifle Volunteers,"—responded to by Mr Hutchinson,—and "The North of England Veterinary Medical Association." Mr Stephenson proposed "The Royal College of Veterinary Surgeons;" followed by "The Visitors;" "Kindred Institutions, Metropolitan and Provincial;" "The President;" "Veterinary Schools;" "The Vice-Presidents;" "Council;" "Authors of the Various Papers;" "Treasurer;" "Honorary Secretary;" "The Ladies;" and the meeting—highly satisfactory to all parties, who had entered into the proceedings with good spirit—terminated by the President proposing the last toast—"To Our Next Merry Meeting."

PERISCOPE.

STATISTICS OF LIVE STOCK. By R. Herbert.

[A Paper read at the Bath Meeting of the British Association.]

In the consideration of the production of live stock for consumption in the United Kingdom, many features of special interest present themselves. Of late years much has been written in reference to agricultural improvement, and in some quarters it has been affirmed that we are in a position to raise every head of stock necessary for consumption without the aid of the foreign grazier. It might be considered an important matter to render ourselves independent of the producers in Holland, Denmark, Germany, and Spain; but the question here arises—How are we to accomplish so desirable an end? The rapid increase in the population of Great Britain during the last ten years, and the consequent increase in the consuming powers, added to the extraordinary progress of trade and commerce, and the improved monetary position of the great mass of the consumers of meat, prove beyond a doubt that the period has now arrived when strenuous efforts are absolutely necessary to meet a demand that must continue to have a most important bearing upon price. At the present time both beef and mutton are selling at fully 1½d. per lb. above the rates current twenty years ago. Prices are still tending upwards, and the prospect is that prices will rule high for a considerable period, notwithstanding that we may continue to import liberally from abroad. Had it not been for a free importation from the Continent, nearly all kinds of meat would ere this have been selling at enormous prices. Consumption must of necessity have declined, and a certain amount of discontent must have been apparent amongst the labouring classes. But let us see what has been our actual dependence upon the foreigner. In 1853, we imported 125,253 beasts, and 230,037 sheep and lambs. In 1863, the supplies received were: —150,898 beasts, and 430,788 sheep and lambs. The increase in the ten years is only about 25,000 of the former, and 200,000 of the latter. These supplies, however, though for the most part in very middling condition, have materially assisted the consumption, and prevented prices from advancing to dangerously high figures. We could all desire to see home productions keeping pace with the demand. But if we closely examine the returns of the great Metropolitan market, which has to furnish a supply for nearly 3,000,000 people, we shall find a state of things which would appear to shake confidence as regards our powers of production. In 1853 and 1863 the total supplies of stock disposed of in the above market were:—

	1853.	1863.
Beasts	252,624	288,177
Sheep and lambs	1,325,474	1,389,142
Calves	20,395	23,291
Pigs	34,677	53,985

From the above figures we must deduct the numbers of foreign stock offered, in order to see how far production has increased in the United Kingdom. Those numbers were:—

	1853.	1863.
Beasts	52,344	72,907
Sheep and lambs	220,499	285,296
Calves	22,619	26,630
Pigs	8,508	17,562

It follows, therefore, that the increase in home-fed beasts in the ten years was trifling in the extreme, and that there was a falling off in the supplies of English sheep in 1863 compared with 1853. Hence, it will be perceived the question assumes more than ordinary importance, because the progressive nature of our home and foreign trade, and the increased power of purchase and consumption, must at no distant date tell seriously against the consumers. Let us now see how prices have ranged in the ten years. In 1853 and 1863 they were as under:—

	1853.	1863.
Beef, from	2s. 6d. to 5s. 0d.	3s. 4d. to 5s. 2d.
Mutton	2s. 6d. to 5s. 4d.	3s. 6d. to 6s. 2d.

In the period here alluded to, then, inferior beef has advanced 10d., and all kinds of mutton 1s. to 1s. 2d. per 8 lb.; although, as I have shown, the arrivals from abroad have continued to increase. If we refer to 1842, and to the ten years prior to that period, we shall find even a greater difference in value. The best Scots were seldom worth more than 4s. to 4s. 2d., and the best Downs 4s. 6d. to 4s. 8d. per 8 lbs. There is therefore, a much larger profit to the grazier without a corresponding increase in the supplies. We will now consider from what quarters London has derived its supply of stock. In 1853 and 1863 the arrivals were:—

	1853.	1863.
Lincoln and Leicester	56,650	66,280
Norfolk and Cambridge	60,490	70,790
Other parts	31,700	27,580
Scotland	18,446	12,823
Ireland	10,200	12,844

This statement shows that we received about 20,000 more beasts from Lincoln, Leicester, and Norfolk in 1863 than in 1853; and that the arrivals from other parts of England, as well as from Scotland, have fallen off. Ireland exhibits a slight increase, but the quality of the arrivals from that country shows no improvement. In reference to the deficiency in the weight of beasts from Scotland, a few observations are necessary, because we must not take the London market as a test of the productive powers of that country. Every year stock has increased in number, but the additional supplies have found their way to London and various parts of the country in the shape of dead meat. In the two years ending with 1853, about 20,000 carcasses of beef and 200,000 carcasses of mutton, received from Scotland, were annually disposed of in Newgate and in Leadenhall. In the two years ending with 1863, the average number of the former received by railway and steamboats was 27,000; of the latter, 300,000. It follows, therefore, that the production of food in Lincolnshire, Leicestershire, Northamptonshire, Norfolk, Suffolk, Essex, and Scotland, has steadily increased during the last ten years. And were it not that the dead markets were from time to time heavily supplied with meat from Scotland, Yorkshire, &c., prices would have been unusually high, since it is evident that the quantities of stock exhibited in the cattle-market are wholly inadequate to meet consumption. Again, we may remark that at various periods of the year large numbers of prime beasts and sheep are purchased in London for transmission to the various outports and watering-places. It would be difficult to ascertain the quantity of meat annually consumed in the Metropolis, but we may consider it about as follows:—250,000 beasts, 1,500,000 sheep and lambs, 20,000 calves, and 400,000 pigs. The enormous supply required year by year proves that great efforts will be necessary on the part of our graziers to meet the still increasing volume of trade. If, however, we consider the progress made in the rearing and feeding of stock in some parts of England, we shall find reason to apprehend that, to some extent, we are in a non-progressive state. We have shown that the great grazing districts—viz., Lincolnshire, Leicestershire, Northamptonshire, Norfolk, and Suffolk—continue to maintain their superiority. But what, it may be asked, is the barrier to progress in other quarters? Some remarkably fine Herefords and Devons are disposed of in London; but the number is too small to have much influence upon prices. Lincolnshire and Norfolk especially continue to furnish their full quota of prime stock, and Scotland supplies us with animals of a first-rate character. But what are all other districts about? The consumers now offer a price which, it must be admitted, is highly remunerative; the wants of the country are increasing every year; and those who have succeeded in getting possession of prime stock for breeding purposes are making large fortunes. Some twenty or twenty-five years ago, Pembrokeshire furnished us with from 6000 to 7000 head of beasts every season. Now, the number available for the Metropolis does not exceed 600 or 700. Again, the Metropolis could rely upon some 8000 or 10,000 Romney Marsh sheep—one of the finest breeds in England. Now, very few find their way to London, although high prices are offered for them. Those two sources of supply have, therefore, been partly dried up, and we are compelled to look to the favoured districts and to Scotland for the adequate amount of food. I have no desire to draw invidious comparisons, but it is well known that Lincolnshire, Norfolk, and most of what are termed the "crack" grazing counties in England, are farmed by rich men. Some of them have leases. Their lands are, with very few exceptions, well drained, and they have succeeded in raising a highly valuable breed of stock. The grazing community in Norfolk, Lincolnshire, and Scotland are now raising stock of a first-class

character, and of late years they have adopted a system of breeding which has added materially to the supply of food. The famous shorthorned breeds have been largely introduced into Scotland, and been used for crossing purposes among the best Scotch breeds. The result of this mixture has been early maturity—that is to say, Scotch, or rather crosses, are now forwarded to London from Scotland weighing from 80 to 100 stones of 8lbs. each under two years old. Formerly, so much weight and quality could not have been produced under from three and a half to four years. The result is that very few really pure Scotch are now to be met with either in Scotland or Norfolk except for breeding purposes. This, perhaps, is one of the secrets why stock has not further advanced in price. But is there no possibility of carrying out the system further? I am aware that many graziers in England are opposed to the crossing system, and they prefer the pure breeds to any other on principle. There are, however, obvious difficulties in the way, which time alone will move. Clearly, the soil of England, as a whole, is not half drained; and in too many counties it is badly farmed. Not a few of the farmers are labouring under the great disadvantage of the want of capital; and the majority of them are without leases. Inferior drainage, poor pastures, and a slothful attention to the requirements and capacities of the land, would never meet the wants of lean stock from Scotland. And were the stock placed upon other than strong pastures, the losses would be serious. Again, the small grazier, with limited means, cannot give the enormous prices demanded for the shorthorned bulls. The consequence is, that there is virtually a monopoly in the production of food; and nothing short of an enormous outlay of capital in other counties, for drainage and other purposes, together with a more general system of letting land upon moderately long leases, will ever destroy it. At present the prospect is, even with increased importation of stock from abroad, that all kinds of meat will be very high in price for a long period. We must bear in mind that France, like ourselves, is suffering from a scarcity of stock, compared with the consuming powers of the country. Last year the imports into France, chiefly from Holland, Germany, Belgium, and Spain, amounted to nearly 600,000 head; and yet prices ruled high. From that country, therefore, we can expect no aid, because she is now competing with us for a supply of food. Here let me remark that the Norfolk and Scotch graziers possess great advantages in the production of stock. They have wisely turned their attention to the cultivation of beetroot and turnips upon extensive breadths of land. They have succeeded in raising enormous crops upon a moderate description of land, and secured ample supplies of cattle-food for winter consumption. It has become unfortunately necessary that the breeders in other counties should, if possible, follow their example. To show more fully the great changes which have taken place of late years in the various breeds of beasts exhibited in London, and which may be taken as a fair index of the whole country, I may observe that in 1853 the percentage of the shorthorns was about 30; of Herefords, 13; of Devons, 11; of English crosses, 12½; of polled, or Scotch cattle, 10; and of Scotch crosses, 1·50. Welsh beasts figured for 10 per cent. of the total supplies. Last year the percentage of the shorthorns increased to 35; Hereford declined to 9½; Devons to 5; English and Scotch crosses advanced to 23; but Welsh beasts figured for only 1·75. It will therefore be perceived that the shorthorns and the various crosses are furnishing the Metropolis, so far as live stock is concerned, with a moiety of the supply. In the production of sheep, equally important changes have taken place of late years—indeed, so extensive have they become, from the adoption of the system of crossing, that some breeds once in great favour with the butchers are becoming almost extinct. In 1853, the percentage of the pure Lincolns exhibited in the Metropolitan market was 28; of Leicesters, 26; of Southdowns and Hampshire Downs, 10; of crosses, 15; of Kents, 5. In 1863, Lincolns declined to 22½, Leicesters to 22, and Kents to 3. Southdowns and Hampshire Downs figured for 15½; crosses, 21. It is satisfactory to find that the new system, though it has failed to meet consumption, has been constructed on a good basis—that is to say, the best and most enduring breeds of both beasts and sheep have been allotted by the breeders for crossing purposes. But the system of crossing may, without the exercise of great judgment on the part of those most interested, be carried too far. So long as care is taken that there is an ample supply of pure blood to breed from, so long will the system continue. Without pure blood, however, we shall raise only a mongrel and profitless description of stock, of very little value either to the feeders, butchers, or consumers. In conclusion, I may observe that there is no actual want of supply of stock in England. It would be impossible, in the absence of statistical details, to give an accurate statement of the numbers in each district, but my impression is, that the number of beasts is about

4,700,000; of sheep, 32,000,000 head. These numbers, however, are about the same as we had some twenty years ago; hence, it follows that even the new system of crossing has, from the enormous consumption going on of late years, failed to insure for us what may be termed an abundant supply of food. Meat, therefore, assuming that the country continues in a flourishing state, must of necessity continue high in price for some time.

PRESENT CONDITION OF THE TURF.

(To the Editor of the Sporting Gazette.)

SIR,—It will be admitted by every Turfite who was conversant with racing affairs thirty years ago, that they have been gradually declining from what in those days was an agreeable and profitable pastime, to a lamentable condition of degradation and demoralisation. In former times, a meeting at Newmarket was always anticipated with a degree of pleasure, as an occupation attended and patronised by such noblemen as the Dukes of Portland, Grafton, and Rutland, Earls Egremont, Grosvenor, Clarendon, and a host of others of that stamp, who kept studs to furnish the best horses for their own gratification and for legitimate purposes in racing; and if we excepted the two breeding establishments of Mr Nowel, of Underley, and Mr Richard Wilson, of Didlington, there was scarcely another to be met with breeding thorough-bred stock for the purpose of sale only. Now we have at least twenty different studs, many of magnitude, and one of them belonging to the Crown, in which thorough-bred yearlings are produced with no other view than of realising a profit by their annual sale at auctions.

Formerly we were accustomed to feel satisfied if we had the opportunity afforded us of seeing half a dozen races of interest in one day; now we are oftener obliged, even at Newmarket, to look on whilst some fifteen events, more or less, are being contested, and many of them paltry affairs, "the winner to be sold for 20 or 50 sovereigns." It is true that the number of animals bred for racing is now far greater than it was; that we have about 2500 mares and 300 stallions, all of pure blood; and although amongst such numbers there will always be found some of great superiority, and enough to sustain a certain reputation, yet it is evident that quantity rather than quality is the prevailing order of the day. The cost of training and entering horses for stakes deterred breeders from engaging an unpromising yearling, and they wisely selected their best only, and sold their refuse; but handicaps and half-mile races, for which there are always an overwhelming number of worthless rips, are now in fashion, and have been created purposely for the unfortunate owners to get a chance of running them to serve a betting purpose.

The facility which vans and railroads have furnished for conveyance everywhere has been a means of destroying a great many of our best horses of all ages, but particularly two-year-olds. We have but to refer to the book "Calendars" for proof of the injurious number of engagements our young horses have to perform in—many three-year-olds with over twenty races to encounter in the year; and for an example of two-year-old treatment, we find that "Catalogue," a two-year-old filly, last year ran no fewer than twenty-one races, and was successful in winning thirteen of them. It too often happens at a race course we are kept waiting more than an hour, because the starter is vainly endeavouring to get some thirty runners off, to scamper half a mile; and except to the betting man, during this tiresome delay, who is thereby favoured by more time to pursue his calling, there is neither profit nor amusement.

The Jockey Club has shown its power at Newmarket by excluding from the Heath a reporter, because his observations were considered obnoxious; but it admits to the betting ring, for the weekly stipend of 10s. 6d., the very lowest refuse of society—men who are a nuisance in every populous town—ruffians whose language is filthy, and whose demeanour is such as might be expected from low pugilists and their associates. Many of these notorieties, fearing they should not be recognised, have taken to wear a placard in their hats, and in large letters we have Mr Sharper of Penzance, Mr Nobbler of Berwick, Mr Landshark of somewhere else, *cum multis aliis* of the same obliging character. A fellow formerly, with a bill stuck round his hat, was only to be met with blowing a horn to sell papers, or a list of all the running horses, with the weights, names, and colours of the riders. The entire disregard of decency and respect in the authorised ring has engendered the formation of another, in close contiguity to it, where every potboy and stable lad who has a few shillings

or a few pence can find the opportunity of depriving himself of the means which should have been employed to cover his half-naked limbs. This scene has only to be witnessed to create the contempt and disgust it richly deserves.

It was not thus in the days of Crockford, Gully, Cloves, Stuart, Justice, Brunton, and many others equally respected, but long since gathered to their forefathers. Then, it may reasonably be asked, what has led to this sad change?—for no doubt it would now be a very difficult task to alter the present circumstances, and yet if they are to be fostered as they have been hitherto, instead of being checked by the presiding authorities, it must be obvious that the result will be to deter every man of respectability from patronising such depravity by his presence.

In France, the Government spends large sums of money in the purchase of our mares and stallions, and Frenchmen have not yet commenced to abuse their young animals. In our own country, it is the individual, aided by a genial soil and climate, who has hitherto excelled all nations in the different breeds of horses, but particularly the thorough-bred one; but, with the energy of our Continental neighbours and our own apathy, the day may too soon arrive when we shall no longer possess a *prestige* of superiority, and which was so justly an Englishman's pride.

During the reigns of George IV. and William IV., their Majesties, at the solicitation of influential persons, were induced to give several plates to be run for in various localities, to produce sport; and thus we find our gracious Queen is now paying from the Privy Purse annually the sum of one hundred guineas at each of the following places:—Chester, Hampton, Goodwood, Bedford, Shrewsbury, Leicester, Liverpool, Northampton, Egham, and the Curragh. If these sums were required formerly, when without them there were not adequate means for the supply of racing purposes, it would certainly now be a boon to the condition of our over-worked horses to withdraw an amount of money which is causing injury rather than benefit, and which might be more profitably, if wisely, invested in the purchase of first-class thorough-bred stock for the royal paddocks. As to the Queen's plates, about which we so often have a foolish controversy, it would be more consistent to withhold them, and give up the heavy tax upon every race horse, which produces a greater sum to the revenue than they do.

The racing season begins on the 21st instant, at Lincoln, where we have no fewer than forty-four two-year-olds entered in a stake of 5 sovereigns each, 40 added; and several of these young creatures belong to members of the Jockey Club, who put 8 stone 10 lbs. on the back of an animal whose bones, still in a cartilaginous condition, are called upon to support them in a gallop of half a mile, urged to such a trial by whip and spur! The Royal Humane Society ought to interfere in such cases of cruelty, and the promoters of them deserve to be fined for their inhumanity.

The Jockey Club is the presiding body to which we are accustomed to look for rules and regulations to govern all circumstances connected with the turf, and as a body, individual opinions and interests should never be permitted to interfere with those duties which could be made avoidable, to prevent racing from becoming an injury, as it really is, instead of a benefit to both man and horse.

It is sincerely to be hoped for that the members of the Jockey Club may find a higher and more profitable employment than in making handicaps for hacks, and that they may deem it necessary to take into their consideration the steps to prevent the very vitals of the turf coming to an untimely end.—Your obedient servant,

HAMPTON COURT, *Feb.* 9, 1865. W. J. GOODWIN.

A NEW CROP FOR CATTLE.

THE *Agricultural Gazette* announces a new green crop, yielding forty tons per acre of a food especially adapted for milch cows, as, being void of all aromatic flavour, it communicates none to milk. The cattle melon, a sort of gourd, grown like mangold-wurzel, but at wider intervals, appears in Mr Blundell's hands to have furnished a solid and substantial food, good for fattening bullocks, as well as for cows, and sheep, and pigs. Dr Voelcker's report of its composition is favourable; and there is every reason to recommend our readers to give it a trial. The following is Mr Blundell's account of it:—

"This variety of the gourd tribe seems to have been hitherto overlooked, and not considered as adapted for cattle-feeding. My attention, however, was called to it a

few years ago by a friend of mine in America, in the State of Indiana, who grows them extensively for feeding his cattle, and believes that a much larger and heavier produce of them per acre can be obtained for cattle-feeding than of any known vegetable production used for that purpose. I believe that ideas have prevailed in this country that our climate in the open air was unfavourable to their production, and, indeed, hitherto they have been usually grown for fancy purposes by the aid of artificial heat and large quantities of manure, in which case most of the varieties I have noticed, when thus treated, are very hollow and worthless for feeding animals. Not so, however, with the varieties as selected and grown by myself for some years past; for when cultivated in the open air with a moderate amount of manure—in fact, the same quantity as required for other vegetable produce in field culture—they are very solid and weighty, and possess considerable feeding value, (equal to the common white turnip,) and are especially adapted for the feeding of milch cows at the time of year when grass is usually short and scarce, and before turnips, &c., are ripe and fit for feeding in the months of August, September, and October. During the past season I had fed the milch cows with them; and from the circumstance of the fruit being so very agreeable, and so completely void of any peculiar flavour, like turnips and most other vegetable produce, it does not affect the flavour of the butter injuriously; but, on the contrary, I have never made butter, or tasted any made from cows fed on vegetables or roots, equal in quality to that made when the animals have been fed on the cattle melon. The cultivation may be carried out upon land usually appropriated to root culture, and particularly in the southern and eastern counties; they will flourish and produce very large crops per acre under ordinary culture, such as may be required for mangold-wurzel, swedes, carrots, &c., which the following experiment will prove:—

"On my own farm at Bursledon, near Southampton, a field prepared for mangold as usual, the land being sandy loam on a brick earth, was ridged 2 feet apart, manured with twenty tons of box dung and one cwt. Peruvian guano per acre, mangold seed dibbled on the ridge, May 15. A ridge 4 feet wide, extending the whole length of the field, was dibbled, May 15, with cattle-melon seed, and the same quantity of manure applied as for the like space of mangold. The crop of melons was removed on the 28th September at the rate of 40 tons per acre, there being 37 fruit per pole, weighing 560 lbs., and the yellow globe mangold crop removed on the 3d November at the rate of 22 tons per acre.

"The expenses attending the cultivation of each crop were exactly the same. The melon plants, being four feet apart, give ample space either for the plough or cultivator, and the growth of the plant is so slow in the early stage that the cultivation may be continued for five weeks after dibbling the seed. When the plants begin to spread, the growth is so rapid that all the land is covered with foliage in about seventeen or eighteen days; and at the end of five weeks after the blossom the fruit will weigh 30 lbs. and upwards.

"Having for two seasons fed my fattening bullocks upon the melon, and the animals having fattened beyond my expectation, yet I wished to know the feeding value by analysis, and for that purpose forwarded to Dr Voelcker part of a fruit which weighed 16 lbs.

COMPOSITION OF CATTLE MELON.

First General Composition.

Water,	92·030
Organic matters,	7·350
Minerals matters (ash)	·620
	100·000

Second Detailed Composition.

Water,	92·030
*Soluble albuminous compounds,	·619
†Insoluble albuminous compounds,	·156
Sugar and mucilage,	4·661
Woody fibre (crude,)	1·114
Soluble mineral matters,	·540
Insoluble mineral matters,	·080
	100·000

* Containing nitrogen, . . .	·099
†Containing nitrogen, . . .	·025
Total nitrogen, . . .	·124
Equal to albuminous compounds, (flesh-forming matters,) . .	.775

"My conclusions are as follow:—The cattle melon is now known to possess valuable feeding properties, and is readily eaten by cattle, sheep, and pigs. It is easy of cultivation, exhausts the land less than any root-crop, being less time in the ground, and deriving so much nutriment from the atmosphere through the large and luxuriant foliage, it is more certain to plant than root-crops, having fewer enemies, and may be cultivated upon all soils suitable for root-crops."

TATTERSALL'S.

"ESTABLISHED 1766,"—we learn from the simple inscription on the keystone of the new premises at Knightsbridge. Just ninety-nine years ago, come Michaelmas 1865, the great-grandfather of the present partners of the firm obtained from the grandfather of the present Marquis of Westminster the lease of the ground in Grosvenor Place, and established the "concern," whose name is "familiar as household words" throughout every portion of the civilised globe—famous alike for its honourable mercantile position, and as the seat of government of all matters connected with the enormous speculations that wield the destiny of the turf. What a theme for the moralist and historian does that simple word—Tattersall's—open up! How fortunes have been won and lost in "the Room," and how emperors, princes, and the most exalted of the aristocracy of all nations, have rubbed elbows with dealers, "legs," "copers," and the lower order of the "ossitocracy" in general in "the yard;" but however tempting the theme to go back a century to sketch the history of Tattersall's itself, or to record the gradual increase in the business of the eminent firm who at last found themselves so cramped for room and otherwise inconvenienced as to sigh for "fresh fields and pastures new," we must defer the task to a future occasion, as the present article has mainly reference to the new establishment recently erected by Messrs Tattersall at Knightsbridge, rendered necessary by increased demands for accommodation on the part of the public, and by the expiration of the lease of the present premises at Michaelmas next. A great many of the Marquis of Westminster's leases in the immediate neighbourhood fall in at the same time, and before the year is out all traces of the "ride" or "lawn,"—the favourite spring and summer retreat, with its shady tree in the centre, and characteristic "milker," (who, curiously enough, invariably hangs about certain members in the "milky way,") and the exclusive *rendezvous* of the subscribers on the Sundays before the Derby and St Leger, when the Subscription Room remains closed; where, too, Masters of Hounds used to look over the various packs when up for sale—will have disappeared, together with most of the houses in Grosvenor Place between St George's Hospital and Chapel Street. Grosvenor Crescent will sweep into Grosvenor Place, where it is intended to erect some of the finest mansions in London; and some idea of their palatial grandeur may be formed when we state that there will be only five houses between the Hospital and Halkin Street, each of the estimated value of £25,000. Nor are these the only improvements about to be carried out by the Marquis of Westminster, who intends, we hear, to erect splendid squares and boulevards on the recently-cleared vacant space this side of the Grosvenor Hotel, upon which, and in the neighbourhood, no fewer than thirty-six public-houses have been pulled down within the last six months, so averse is the noble marquis to having a single "public" on his property!

However anxious to study the accommodation of their numerous patrons, both in the business and betting lines, Messrs Tattersall found it no easy matter to obtain the requisite amount of land in a suitable locality within a convenient distance of the West End; but fortune favoured them in the immediate neighbourhood of Knightsbridge Green, this side of the barracks, at the corner of Brompton Road, within a stone's throw to the top of Sloane Street; and some idea of the increasing value of freeholds in that locality can be formed from the fact of Mr Richard Tattersall, who bought the ground six years ago, having refused between three or four times the amount of his purchase money within a short period of the completion of the bargain, and be-

fore he had even commenced to build! In the neighbourhood, it is true, are some of the vilest dens in the metropolis, but their days are happily numbered, and before long the present unsightly row of small shops which form the junction of the Brompton and Knightsbridge roads will be removed. This will "throw open" Messrs Tattersall's new establishment, and besides improving the approaches thereto, show off the architectural merits of the building to greater advantage than at present. The proprietors are likewise in treaty with the Dean and Chapter of Westminster, to whom it belongs, for the small railed-in oval-shaped bit of grass land—Knightsbridge Green proper—with which all Brompton travellers are familiar, more for the sake of improving their frontage than any other purpose, as it is of no absolute use; nor, if it could be transferred *en masse* to the rear of the new Subscription Room, would it replace the agreeable "lawn we leave behind us" at Hyde Park Corner. This "rural spot," by the by, played an important part during the great Plague of London, at which time Knightsbridge was "so far in the country" that an immense pit, which formerly existed there, served as a charnel-house, and was literally filled up with corpses. In excavating for the foundation of the new buildings a great many skeletons were discovered, and one of the partners of the firm was thereby enabled to fulfil a promise he made to his wife, that she should have all the "treasure" discovered! Here, too, stood the Old Manor House, which was erected three hundred years ago, and was the residence of Sir John Lade, (a celebrated character in the time of George IV., who drove four-in-hand round Lackington's shop in St Paul's Churchyard,) some mementoes of which have been preserved in the new private offices of the firm, (built upon its site,) in the shape of an oak staircase, conducting from the ground floor to the Committee Rooms above, (in one of which Marshall's well-known picture of Eclipse will be hung,) and a marble mantlepiece of great beauty, which adorned the drawing-room of the old building, and is now put up in Messrs Tattersall's private sanctum.

The offices, store-room, and dwelling-house of Carter, the manager, are on the right-hand side as you enter the lofty gateway, (in the central arch of which is an immense tank for supplying water to the premises, with appropriate apparatus for submitting welshers, and other "black sheep" who may intrude their "unholy presence," to the water cure,) and separated by a lofty screen from the public entrance, whereby all communication is cut off. On the left is the Subscription Room, with separate entrance "for subscribers only" from the outside, and a private communication with the Committee Room "over the way." This passage is somewhat narrow, perhaps, and will not allow of members loitering about, as it was desirable to throw all the available space into the room itself, which, when finished, will be one of the handsomest in the kingdom—much larger than the Newmarket one, and, though not quite so long, as lofty and far more elegant than Doncaster. In addition to the windows at each end, it is lighted and ventilated by two lofty domes, between which, in the centre of the ceiling, is a sunlight for illumination in winter. We hardly know which will strike strangers most—the noble proportions of the room generally, the richness and brilliancy of the decorations, or the Byzantine floor, which has been laid down by Messrs Simpson & Sons, of 456 West Strand, and contains no fewer than 200,000 pieces of Maw & Co.'s coloured variegated tiles. These are also used to ornament the sides and backs of the fireplaces, and present a beautiful contrast to the Italian marble and Derbyshire Spa mantlepieces, over which are lofty mirrors extending to the roof. The walls are decorated in panels of green and gold, and round the whole extent of the room is a raised dais, on which handsome morocco seats will be placed, so that, when completed, no club-house will be able to boast of a more magnificent or luxurious apartment. There are two entrances, one at the side, and the other at the west end, and at the door of the latter, which leads into a paved yard, repose the two stone lions which kept guard for so many years on the top of the gateway at the entrance to the "ride" and present Subscription Room in Grosvenor Place. That the "lawn" will be missed in the summer it would be absurd to deny, and many will no doubt sigh for "the old place" before they become accustomed to the new one; but "what can't be cured must be endured," and as members will be able to enjoy their weed in the air—happily "no smoking is allowed in the Subscription Room"—they must put up with one loss for the enormous gain that the comfort and convenience of the new chamber will secure them. Nor has it been studied inside only, as an inspection of the private offices in the yard, where the telegraphic office is erected so as to be free from public intrusion, will show.

Turning now to the business portion of the new establishment, the prevailing characteristics—elegance of design, vast space, and general excellence of arrangement—cannot fail to strike the *habitués* of the old mart with equal surprise and

admiration, as we feel convinced will be felt by the members of the Subscription Room when they assemble therein on the Monday after Northampton, April the 10th, for "settling" on the first "legitimate" race meeting of the season. The first public sale will take place on that day, and not only has every stall been engaged for some time past, but we learn from Messrs Tattersall that they are "very full" for the months of May and June. They have been compelled to disappoint more than one breeder of blood stock; in fact, notwithstanding the increased extent of the accommodation. For the sales of blood stock in particular, the new premises afford vast advantages over the "old shop," both as regards the "auction mart" itself and the excellence of the "boxes." The latter are built at the rear of the main building, away from the noise and excitement of the sale-yard, and are twenty in number, ten of which are constructed with wide doors, so that a brood mare and foal may pass through side by side without injury. Timid young ones, we all know, will rush after their dams on seeing the latter led out of a box, and not unfrequently come into collision with the door-posts; hence the admirable precaution of extra width, in addition to which the posts and all the wood-work about the place are rounded, and the handles sunk to guard against injury. There is only one double box in the remaining ten, and the fittings up, ventilation, lighting, draining, and general management are perfection. Vast as the new premises are, Messrs Tattersall have been unable to build kennels for hounds, consequently (for the present) those sales will take place elsewhere, and Mr James Mason has liberally placed his farm at Hendon at the disposal of the firm for the sale of the West Norfolk pack, the only one at present "on the books," at the close of the season.

The sale yard, which is superior to anything in the United Kingdom, covers an immense area; and a "ride" extends all round for "running down," and showing off a horse's action. The building is very lofty, and lighted by a handsome glass roof, which, from the intricate nature of the supporting iron-work, alone necessitated the writing of a "big cheque." The ground floor is devoted to stabling, and above is a commodious gallery (with hydraulic lift attached) for carriages and harness, which is open to the yard, and will be found a delightful retreat on crowded sale days, both for spectators and purchasers, as the pulpit, in the right-hand corner, commands the whole extensive area, thus removing one very general source of complaint amongst noblemen and gentlemen who have to put up with all sorts of inconvenience from the crowded state of the yard in the present locality. The stalls are ninety-five in number, "one as good as another," and equal to anything we have ever seen in England or on the Continent, racing stables included. All the latest and best improvements have been introduced, and special attention has been paid to drainage and ventilation, whilst the comforts of the animals themselves has been studied in the minutest particular. There is only one double stable of thirteen stalls in the whole place, and there is sufficient space in the centre, as well as in all the other stables, for the most timid visitor, male or female, to inspect the occupants without fear of being kicked. Each stall is nearly six feet wide, and of sufficient depth to prevent horses hanging back to kick round at each other. The partitions are of elm, the floor asphalte, and the fittings of iron, with polished slate backs above the manger; there is a constant supply of water to each stable. The latter has been obtained by sinking a depth of sixty feet into the sand, in the centre of the sale-yard, where the cupola, surmounted by a bust of George IV., which occupied a similar position over the pump in Grosvenor Place, is in course of erection. We recently announced the discovery made in connexion with this well-known object, which nobody, not even the oldest *habitué* of Tattersall's, will recognise, deduded of its numerous coatings of paint (half an inch thick in places!) in its clean natural stone. Even King George in his cocked hat was becoming "presentable" at the period of our recent visit, and a few carbuncles (which had to be subjected to most stringent "pickle" beforehand) alone awaited the operation of the chisel before receiving the sculptor's "finishing touch."

The erection of these magnificent premises cost an enormous sum, which in no way concerns either ourselves or the public, however; but we cannot conclude the foregoing imperfect and by no means high-coloured description of the "new Tattersall's," without congratulating Mr Freeman, of Lincoln's-Inn Fields, the architect, upon the general excellence of the whole design; Messrs Holland, the builders, upon the superiority and solidity of the workmanship; and the spirited proprietors themselves upon the possession of such an establishment—the gratifying result of a long-tried, honourable career in the public service.

We append a copy of the revised Rules, which come into force on the opening of the new Subscription Room:

1. Any person desirous of becoming a member of this room will be required to send in to the committee an application in writing, accompanied by a recommendation (to be also in writing) signed by any two or more members of the room, to be posted in the room for one clear week. At the expiration of that time he will be balloted for by the committee, five of whom will form a quorum. One black ball in five will exclude. Members of the Jockey Club and of the Arlington, White's, Brooke's, Boodle's, Arthur's, and the Travellers' Clubs can be admitted without ballot.

2. Every member, upon admittance to the room, must enter his name and address in a book provided for that purpose, in which these, together with any other rules and regulations from time to time adopted to be observed by the members, will also be entered; and such signature in the book so containing the said rule and regulations will make it binding on the party signing to abide by all such rules and regulations, as well as by all consequences resulting from breach or non-performances thereof; and such signature shall moreover be taken and deemed to absolve every person concerned in carrying out and enforcing such rules and regulations against such subscriber from all personal responsibility or legal liabilities on that account.

3. No person who shall have made default in payment of stakes, forfeits, or bets, or who shall have been party at any time, anywhere, to any fraud or malpractice connected with horse-racing, shall be admitted a member of this room. And if any member should be hereafter discovered to have been, or should at any time become a defaulter, or be guilty of any fraud or malpractice as aforesaid, and, upon complaint to the committee, shall be adjudged by them to be so, his membership shall thereupon at once cease and determine, and he shall thenceforward be excluded from the room.

4. Any member of this room having a disputed bet with another member shall be bound, if required by him, to refer such dispute to two referees (being members of the committee,) one to be chosen by each party; such referees to appoint an umpire (being also a member of the committee) before they proceed to hear the case; in the even of the referees not agreeing in the choice of an umpire, such umpire to be appointed by the committee, and the decision of such referees or umpire to be final. Any member refusing to refer any bet so disputed, or to comply with the decision consequent upon such reference, within one calendar month next ensuing after notice of such decision from the referees or umpire, either personally or by letter, to be addressed by post to the residence of such member as entered in the subscription book, shall, upon complaint to the committee, be deemed to be, and be treated by them as a defaulter under the provisions of the third rule.

5. Any member smoking in the room, or creating a noise, uproar, or disturbance, will thereby forfeit his right of membership, and render himself liable to immediate expulsion.

6. The annual subscription to the room will be two guineas, commencing on the 1st of January.

7. The room will be opened on every Monday and Thursday throughout the year, at one o'clock in the afternoon; and on every day (excepting Sunday) in the weeks immediately preceding the Epsom and Ascot meetings, and on any other days that the committee may consider advisable.

8. The following members will constitute the committee, of whom any five may form a quorum, and in the event of an equal number of the committee being present, and of an equal division taking place upon any question, the chairman *pro tempore* shall be entitled to a casting vote, in addition to his vote as a member of the committee. In case of any member retiring from the committee, his successor will be nominated by the committee, so that the original number of members constituting the committee may always be kept up.

COMMITTEE.—His Grace the Duke of Beaufort, the Earl of Chesterfield, the Earl of Coventry, the Earl of Westmoreland, Viscount Exmouth, Hon. Colonel Henry Forester, Hon. Admiral Rous, Mr H. Lowther, Colonel Astley, Mr O. Higgins, Mr G. Payne, and Mr P. F. Wallace.

ON THE GROWTH, MATURITY, AND AGE OF ANIMALS, AND ON THE DEPOSIT OF FAT AS INFLUENCED BY THE NATURE AND QUANTITY OF THE FOOD.

By Edwards Crisp, M.D., late Physician to the Metropolitan Dispensary, F.Z.S., &c.

In this essay my intention is to take a wide and comprehensive view of this matter, and to endeavour, by looking at the various classes of animals in a state of nature and in confinement, to throw some light on this most important question, viz., *the best and most economical means of fattening the domestic quadrupeds and birds that are used for the food of man.* There are some who may object to the introduction of any animals except the ox, the sheep, and the pig; but this would be taking, I think, a very limited view of the question.

Many of the important discoveries in physiology and several in pathology have been derived from the lower animals, and there is no reason why in this particular inquiry, by taking a more comprehensive view of the matter than has hitherto been attempted, we may not profit largely by the investigation; for, as regards the deposit of fat, the physiological law is equally applicable to man, ox, bird, reptile, or fish; and I may here express my belief that a vast number of animals that are now considered unfit for human food may, by a proper system of feeding, minister advantageously to the support of man.

I divide my communication into five parts:—

1. The growth, maturity, and age of animals, and the quantity of their food.
2. On the composition of fat, its mode of formation, and uses in the animal economy.
3. The deposit of fat in man and in the various classes of animals.
4. The best and most economical methods of fattening the ox, sheep, pig, and other domestic animals, with a short account of those organs chiefly concerned in the elimination of fat.
5. The supposed injurious effects produced by the obesity of the ox, sheep, and pig.

1. *The Growth, Maturity, and Age of Animals, and on the Quantity of their Food.*

Among the domestic quadrupeds that chiefly concern the agriculturist there may be some difference of opinion as to the time of maturity, whilst as regards the average age of our domestic animals we have but little trustworthy evidence, and our knowledge respecting the natural term of existence of wild animals is still more obscure. The horse attains to maturity at the age of 6 or 7 years; the ass at 5; the ox at 4; the sheep at 4; the pig at 3; the fallow and red deer at 6 to 8: the goat at 4 years. Among our domestic birds, the turkey is mature at two years; the cock, hen, guinea-fowl, duck, and goose, at from twelve to eighteen months.

As regards the average duration of life of some of our British animals, from inquiries and investigations I have made, the following estimate will probably not be very incorrect:—Horse, 25 to 35 years; ass, 30 to 40; ox, 15 to 20; goat, 15; sheep, 15; pig, 12 to 16; dog, 14. Among birds, the gallinaceous (poultry) are probably the shortest lived, and the rapacious and web-footed the longest. The great age attained by the eagle, owl, parrot, goose, raven, and other birds, is well known. Many reptiles, as the tortoise and turtle, are very long-lived; and there appears to be scarcely any known limit to the duration of life among fishes. Little is known of the natural duration of life among wild animals used for food in this and in other countries. The elephant is said to cut his last tooth at the age of 80, and probably lives to a greater age than any of the mammalia. The ruminants, oxen, bisons, buffaloes, sheep, deer, and antelopes, are probably, judging from the teeth and from many that I have examined in confinement, comparatively short-lived, the term of existence varying from 12 to 18 years. The wild hogs, peccaries, and tapirs, extensively used for food by the natives of some countries, probably do not reach an advanced age; 14 or 15 years being, I believe, about the average; and the same remark will apply to the Australian kangaroos, animals that in some districts are much used for human food. As with the human species, cases are found of extreme longevity among the lower animals. Youatt mentions an instance of a horse that lived to the age of 62, and I knew an example of a Suffolk cart-mare that bred a foal when she had reached the age of 39. But these are exceptions to the general rule.

To return again to the growth of animals, I scarcely know anything so wonderful

as the rapid increase of a young bird. I have weighed many of the young of our British birds with their parents, and in six or seven weeks from the time of hatching I have found them as heavy as the old birds; but the well-known instance of the increase of the young salmon from a few ounces to 5 lb. or 6 lb. in three or four months during its marine sojourn is still more remarkable, especially when the constant motion of the fish is taken into account. The bird, like the prize ox or pig, is not only abundantly supplied with food, but it is constantly at rest, so that the waste of tissue is comparatively slight. It is only among the birds that are born naked, and that are unable to shift for themselves, that this rapid growth occurs.

As regards the quantity of food taken by various animals in connexion with the deposit of fat, of course much will depend upon the amount of water it contains; thus the elephant will eat a hundredweight of dry substance daily, but it is said that he will consume more than 500 lbs. of green food. The hippopotamus eats about from 60 to 80 lbs. of dry food daily. The rhinoceros, 50 lbs.; the giraffe about the same quantity. Many of the flesh-feeding animals are enormous eaters, considering the nature of their food. The wolverine or glutton of North America (*Ursus luscus*,) weighing about 30 lbs., will consume 6 lbs. of flesh at a meal; the lion about 9 lbs. The Tasmanian wolf, weighing about 40 lbs., eats 4 lbs. of flesh daily, and many of the smaller carnivora eat very freely. The kangaroos are always large eaters, and have complicated stomachs. Among birds the quantity of fish consumed by the fish-feeders—pelicans, gannets, and cormorants—is enormous. Some of the reptiles at certain seasons eat ravenously; the bull-frog (*Rana pipiens*) will swallow five or six common-sized frogs in succession, and the large weight of food taken by the ophidians is well known, but most of the reptiles are in this respect inconstant: I have known a boa constrictor go ten months without food and without any apparent diminution in weight. The fishes are constant and enormous feeders, and as we descend in the scale some of the smaller animals eat proportionately more than the larger.

The daily quantity of food taken by some of our domestic animals is about as follows:—Horse, 16 to 18 lbs. of hay and corn; ox, 2 cwt. of turnips; sheep, 25 lbs. of turnips; pig, 20 lbs. of carrots, potatoes, and bran. The quantity of mixed or dry food will be considerably less, and much of course depends upon the age, size, breed, and constitution of the animal.

2. *On the Composition of Fat, its Mode of Formation, and Uses in the Animal Economy.*

All the fats are ternary compounds of carbon, hydrogen, and oxygen; none of them are nitrogenous. The proportion of these elements varies slightly in different kinds of fat. Chevreul's analysis of hogs'-lard will give the reader a tolerably correct notion of the composition of all:—

Carbon	79·098
Hydrogen	11·146
Oxygen	9·756

Thus the stearin, the hard constituent of fat, differs little from the elain, the oily part, in chemical composition; the former containing a little less carbon and oxygen and a little more hydrogen. Various names have been given to different kinds of fat, as *hircin* to goats' fat, and *phocenine* to the fat of the dolphin, &c.

As will be shewn hereafter, vegetable matter contains often a large proportion of fatty material.

Of its mode of formation and deposit I need say but little, as it is not my intention in this paper to enter into abstruse physiological questions. Whether the fatty matter from the intestines is taken up by the veins or the villi, or whether, as supposed by Liebeg and others, it arises from a process of imperfect oxidation, are subjects of no practical importance.

The question as to the proportion of fat in the ox, sheep, and pig, is one of great interest to the farmer. It is difficult to arrive at very accurate conclusions as to the proportion in the various *breeds*, but the experiments instituted by Messrs Lawes and Gilbert, and published in the "Philosophical Transactions," 1859, were conducted on so large a scale that I believe the inferences will apply to the above-named animals generally. I make a very brief analysis of the conclusions drawn from the chemical examination of a large number of animals. In the carcass of a half-fat ox the fat was 22·6 per cent.; store sheep, 23·8; store pig, 28·1; fat calf, 16·6; ox, moderately fat, 34·8; fat lamb, 36·8; sheep, fat, 45·4; very fat sheep, 55·1; hog, moderately fat, 49·6. *In the above estimates the offal is not included.* The percentage of kidney-fat

was in the sheep 3·60; ox, 5·44; fat pig, 4·32. The omentum or caul in a half-fat ox was to the carcass 4·63 per cent; ox, moderately fat, 7.93; store sheep, 5·14; very fat sheep, 19.5. In the offal the fat amounted to about a quarter, so three-quarters of the total weight of fat belonged to the carcass. The animals were kept without food for twenty-four hours, and the percentage of fat to the *live weight* was as follows:—Very fat sheep, 45¾; sheep, moderately fat, 35½; ox, moderately fat, 30; fat lamb, 28½; pig, moderately fat, 42; store sheep, 18¾. In a bacon-hog nearly one-half of the live weight was composed of pure fat. As regards the proportion of fat to nitrogenous compounds it exceeded these in fat animals in the proportion of from 3 to 5 per cent. In lean animals the proportion of water in the carcass was from 54 to 62 per cent.; in fatter animals from 40 to 50 per cent. Of bone to the carcass in a fat ox, 11·8 per cent.; fat sheep, 8·9; fat pig, 4·6. It must be remembered that in the carcass of a pig the head is included, but not so with the ox and sheep. For minute details I refer the reader to this instructive paper.

It is scarcely necessary to enter fully into this question, as the views of Liebig and other celebrated chemists are so generally known that their repetition will be superfluous. All animal bodies in a state of health contain a certain amount of fatty matter. In a calf, at birth, that I recently dissected, I found a large quantity of fat, and so with other young quadrupeds. The examples I have already given of the autumnal store of fat in the bodies of the hedgehog, dormouse, marmot, and other hybernating animals, for respiratory and heat-forming processes, are well-known instances of the use of this material in the animal economy; but the most striking example that I can quote is that of the fat pig mentioned by Martell in the 9th vol. of the "Transactions of the Linnæan Society." This animal was buried under a slip of earth for sixty days without food, and when taken out alive it had lost 120 lbs. in weight. The fat in this instance, as in the instance of a hybernating animal, furnished the diminished supplies required under such circumstances to support vitality.

3. *The Deposit of Fat in the various Classes of Animals.*

Under this head I am obliged to include the human species, a division that might profitably occupy a larger space than can be given to it in the present paper. It is scarcely necessary to explain, that however man may pride himself upon his intellectual superiority over the brute, in most matters relating to physiology and pathology he is nearly on a par with the lower animals; digestion, assimilation, and all the excretory functions, are governed by the same laws in all classes of animated beings, although, as we descend in the scale, we have less complexity in the machinery; the lowest animal organisms being so nearly related to the vegetable kingdom, that it is somewhat difficult to distinguish between them.

Probably there is no country in the world, except China, where man has so great a disposition to fatten as in England; this tendency arising probably from three causes, viz., climate, the nature of the food, and the desire to accumulate money, so as to enable individuals to retire from business or to diminish their labours, and thus to lead comparatively inactive lives. On consulting several old people, whose recollection extends back to sixty years, I am led to believe that obesity is not so common as it was fifty years ago, especially among farmers and agriculturists. This may readily be accounted for by the greater abstinence and sobriety now existing. Among Europeans—indeed the remark will apply to the human race generally in nearly all parts of the world—those who lead sedentery and indolent lives, who eat much and do little, are often, after a certain age, inclined to obesity. On the contrary, the hard workers in the human hive, as the agricultural labourers, whose muscles are well exercised, are seldom corpulent. In the United States of America a fat person is rarely seen, although many lead luxurious and inactive lives. Trollope, in his late work on the United States, says that "an Englishman who has a tendency to obesity loses it after being a short time in that part of America. It is difficult to account for this; but climate, excessive smoking, and chewing tobacco, are probably important causes. In the Canadas I am informed that the tendency to accumulate fat is greater than in the States."

Among Asiatics examples of obesity are not so frequent as in Europe; and when they are met with, the same causes that I have already alluded to are in operation. In Africa, among savages generally, as I am informed by several travellers, a fat man (unless among the chiefs and kings) is but rarely seen; but the women are not unfrequently fattened, like our prize pigs, to enhance their value, and, according to African taste, *to increase* their beauty; and, degrading as it is to the human species, a useful lesson

may be learned by the agriculturist from the method of fattening these sable beauties, who appear greatly to exceed our prize cattle in obesity. Captain Speke, in his recent work on the "Discovery of the Source of the Nile," gives some amusing examples of this kind. I quote two of them (p. 534):—"King Kamrasis' sisters (Unyoro) are not allowed to wed, and they die virgins in his palace. Their only occupation in life consists of drinking milk, of which each one consumes the produce of from ten to twenty cows, and hence they become so inordinately fat that they cannot walk. If they wish to see a relative or go outside the hut, it requires eight men to lift them on a litter." Again, he describes (p. 231) the sister-in-law of the king of Karague:—"She was another of those wonders of obesity, unable to stand, except on all fours; her body was as round as a ball." Speke saw her sucking a milkpot, the father standing over her with a rod to compel her to drink; and on measuring this woman the following were the proportions of the various parts: round the arm, 23 inches; chest, 4 feet 4 inches; height, 5 feet 8 inches.

Here the same plan of forcing is adopted as in feeding prize cattle, turkeys, geese, ortolans, and other animals, and with a somewhat similar result.

I could quote many examples in this country of excessive obesity occurring (as in the case of Daniel Lambert) without a large amount of fattening material having been taken, but these are exceptions to the general rule. Hereditary disposition, as with the lower animals, has often much to do with great obesity in the human subject; and this tendency to deposit fat is difficult to overcome. The pamphlet lately issued by Mr Banting induces me to say a few words on this subject, as the digression may be serviceable to some of my readers who may be desirous of rushing into extremes. Mr Banting's history may be told in a few words; he was so fat that he could not stoop to tie his shoe-string. By abstaining as much as possible from bread, butter, milk, sugar, potatoes, and beer, and taking chiefly animal food, he reduced himself 35 lb. in thirty-eight weeks; and is now, as he states in the letter that has been so extensively circulated and read, in good health. I allude to this pamphlet only for the purpose of cautioning those of my middle-aged readers who are inclined to extreme obesity, not to attempt the reduction of their bulk by this means without consulting their medical attendants. An animal diet would be highly objectionable to some constitutions, especially to those prone to constipation; whereas the same effect may be more gradually produced by reducing the quantity of the food, and taking, when practicable, a larger amount of exercise.

Let all men who have reached the age of sixty beware of sudden changes in diet and drink.

Lower Animals.

Before I commence this part of my subject, viz., the deposit of fat in the lower animals, I may premise that for many years I have examined a large number of foreign animals that have died at the Regent's Park Zoological Gardens and elsewhere, and that I have taken notes as to the quantity of fat in all. Many of these animals, it may be remarked, are in a somewhat similar condition to our stall-fed quadrupeds; they have but little exercise, eat largely and regularly, not depending upon the somewhat precarious supply of food they often obtain in a state of nature.

Among the apes and monkeys, more than 200 of which I have examined, I have rarely found any amount of fat; but both the Old and New World monkeys, in a state of nature during the fruit season, are often very fat. I have recently had an opportunity of seeing the thoracic and abdominal viscera of one of the largest gorillas (*T. Gorilla*) ever brought to this country, and the intestines, as is often the case in the human subject, were abundantly covered with fat.

The bats in a wild state, previously to their winter sleep, have a large amount of fat in their bodies, and some of the fruit-eating bats (*Pteropi*) are abundantly supplied with this material.

Some of the flesh-feeding animals in confinement are excessively fat. I have seen, I think, a larger proportional quantity of fat in a leopard than in the sheep. In two Tasmanian wolves (*Thylacini*) that I examined some years since, the fat was not only deposited in the abdomen and under the skin, but the interstices of the muscles were filled with fat in a liquid, oily state. These animals eat enormously, and are *exclusively flesh-feeders*. Lap-dogs I have seen in the same condition, but these were not fed on flesh only. Several months ago an old Tibetean mastiff was killed at the Zoological Gardens, and the man who flayed it obtained 36 lb. of fat, and by boiling he reckons that he might have collected double the quantity, so that the proportion of fat in this dog probably exceeded more than half its weight.

All the bears are much inclined to obesity. In the grisly bear, sun bear, black bear, brown bear, and Polar bear, I have seen immense quantities of fat in the abdomen and under the skin. In the Polar bear, a fish-feeder, I have found the oily fat to pervade all the tissues.

The beavers, otters, badgers, and hedgehogs, are often excessively fat, especially in the autumn; indeed, as shown by Liebig, the hedgehog, dormouse, and other hybernating animals, require this carbonised material for their winter store of fuel. The armadillos, which in South America are considered excellent food, are sometimes, in confinement, one mass of fat and oily matter. The kangaroos, too, when in health, are much prone to fatten. Among the ruminants, the deer and antelopes are not often very fat in confinement, although I have met with some curious exceptions.

In four giraffes that I have dissected, I found but very little fat in their bodies. A leucoryx (*A. Leucoryx*) that died a few months since at the Zoological Gardens, from inversion of the womb during calving, had 37 lbs. of fat in the abdomen, and probably as large a quantity might have been collected from other parts of the body; but the most remarkable example of the local accumulation of fat I have met with occurred in an eland (*Oreas canna*,) a large antelope that was killed at the Zoological Gardens in 1860. The animal, from old age and disease, was emaciated and unsightly, and was therefore destroyed. The only fat in the body that I could discover was a large solid mass around the heart, which weighed 8 lbs. 13 oz.; the heart was encased in this dense mass of fat, so that no part of it was visible.

This local accumulation of fat reminds me of the curious deposits in the tails of the Cape sheep, some of which are said to reach the great weight of 20 lbs. The local deposits of fat in the zebu and other wild oxen may also be mentioned.*

Whilst speaking of the eland, I take this opportunity of calling the attention of agriculturists to this animal, as one that is likely hereafter to be acclimatised and used for agricultural purposes. It is nearly as large as a horse, very strong, an excellent walker, and very hardy. The Zoological Society has bred twenty-three since 1852, and only one has died from disease. The herd at Lord Hill's, Hawkstone, have been out in the park during the winter, having only a temporary shed for shelter. The horns in early life might easily be got rid of, and castration would, I believe, render the animal perfectly manageable. The flesh is excellent, as I can testify by experience; and after a few generations this antelope would probably fatten as readily as the ox.

There is another animal among the Pachyderms, the African wart-hog, (*Phacochœrus Æthiopicus*,) that will, I believe, hereafter be introduced into this country for the purpose of endeavouring to effect a cross with our English hog. I have dissected nearly all the wild hogs, but I have never seen in these, or in any other animal, the ribs so thickly covered as in this swine. Mr Bartlett, the superintendent at the Zoological Gardens, tells me that Sir George Grey, who has eaten the flesh in Africa, pronounces it excellent. In none of the wild hogs, peccaries or tapirs, that I have dissected, have I found a large amount of fat.

It has been stated by some comparative anatomists that no fat is found in the body of the elephant when in confinement; but the last I dissected, which died, I believe, from fright during a thunderstorm, was very fat. According to Gordon Cumming, "the fat of the elephant (in a wild state) is a great luxury to the Caffres; it lies in extensive layers and sheets in his inside, and the quantity that is obtained from a full-grown bull in high condition is very great. The Caffres enter the immense cavity of the animal's inside, cut the fat away with their assagais, and hand it to their companions."

There is a curious difference between the hare and the rabbit as regards the accumulation of fat; it is seldom met with in the body of the former in any quantity, but rabbits in a wild state, and especially in confinement, have an abundant supply. The Christmas rabbits in London, as regards obesity, will vie with the prize ox and sheep. The opposite habits of the hare and rabbit in a wild state will readily account for the difference, the comparative deprivation of exercise and the frequent absence of light being important adjuncts in the fattening process. There is one fact connected with these animals which I think may properly be mentioned here—viz., the cross-breed between the hare and the rabbit, termed "leporine." M. Roy, of Angoulême, (France,) by keeping very young hares and rabbits together, has

* I scarcely need add, that among our different varieties of oxen we have local deposits of fat; *thus in* the old Suffolk breed the internal fat is very great, and not dispersed about the muscles, *as it should be in a well-bred* animal, making what is called "marbled beef."

obtained a cross which is more profitable than the rabbit, on account of its rapid growth and larger size. One of these leporines, which I examined, was bred at the gardens of the Zoological Society; and although only 3½ months of age, it weighed 3 lbs. 11 oz. M. Roy sends large quantities of these leporines to the neighbouring market yearly, and finds them profitable. I have entered more fully into this matter in the "Proceedings of the Zoological Society," March 1861. The circumstance is one that may interest some of my readers; but I mention it especially in connexion with the subject I am writing upon—viz., the deposit of fat, as it is tolerably certain that these hybrids (as some will call them) may be fattened to a large size. In concluding this necessarily short account of the deposit of fat in the various orders of quadrupeds, I may mention a curious fact respecting the *Cetacea;* in this tribe of animals the Manate, Dugong, and Stellarine are chiefly vegetable feeders, whereas dolphins, porpoises, cachelots, and others, live on animal food; but the proportion of fat and oil is greatly exceeded in the latter. It must, however, be remembered that the food of the animal-feeders contains a large amount of oily material.

Birds.—Among the feathered creation we have some extraordinary instances of wild birds, although it has been stated by some writers on fatty degeneration in man that very little fat is generally found in wild animals. As is well known, many of the web-footed birds (*Palmipedes*) in a state of nature are very fat, the fat being deposited under the skin as well as in the abdominal cavity; a beautiful provision to enable these birds to resist extreme cold, by the abundant supply of carbon, and by the action of the fat as a non-conductor of heat. An Australian goose, (*Cereopsis*) weighing about 10 lbs., that lately died at the Zoological Gardens, had 3½ lbs. of fat on its body; and, if all had been collected by boiling, probably the quantity would have amounted to 5 or 6 lbs., although this bird was not intentionally fattened.

The body of the storm-petrel, Mother Carey's chicken, (*T. Wilsonii,*) is often so impregnated with fat and oil, that some of the inhabitants of the Hebrides make candles of them by drawing a rush through the body. All the petrels, as is well known, when taken, throw up a large quantity of pure oil from the stomach. These birds are exclusively fish-feeders, and it is more than probable that the oil is at once converted into fatty matter. One of the most wonderful instances of rapid growth and abundant deposit of fatty material occurs in the young of the American passenger-pigeon. These birds are said to have seven or eight broods in the year. In twenty-three days from the deposit of the egg the young bird can fly, being fully fledged on the eighth day. So numerous are these birds that waggons and carts are sent to the place of nidification, and many tons of fat are collected from the young pigeons, which are stated to resemble lumps of butter. In many of our wild British birds I have found a large amount of fat, especially in the flesh-feeders; in the common barn-owl in winter I have seen as much fat as in any wild vegetable-feeder. In foreign birds, in confinement, I have not met with so large a quantity of fat as in the quadrupeds; but many of these have been affected with tubercular disease a long time before death. In the ostrich family—ostrich, rhea, moruk, cassuary, emu, and the great bustard, in confinement—I have found a large amount of fatty material under the skin and in other parts. In one specimen of the African ostrich the fat collected weighed as much as 30 lbs., and was two inches in thickness under the skin of the back.

Reptiles.—Turtles, as is well known, are largely furnished with fatty matter, and the same remark will apply to tortoises, especially at certain seasons. I have dissected many alligators and crocodiles in confinement, but in none of them have I found any large amount of fat; although probably in a state of nature this material is often abundant. In many of the lizards, as in the iguanas, fat is stored up in great abundance, as I have seen in several that have recently arrived in this country. In the large pythons and boa-constrictors I have found several pounds of fat deposited in button-like flakes in the abdomen; in some that had not fed for many months the fat has been abundant: but it must be remembered that the absence of animal-heat and the comparative inactivity of the respiratory functions will readily account for the non-absorption of this element for the process of combustion.

Many fishes, as is well known, are highly impregnated with oil, although the presence of solid fat is less frequent in this class. From a part only of the flesh of a tunny (*Thynnus vulgaris*) that I dissected some years since, I obtained five quarts of oil. When the quantity of oily matter in fish is considered, the great obesity of many birds that prey upon them is readily accounted for.

In many of the invertebrate animals large quantities of fatty matter are stored up.

Some insects both in the larval and perfect states are abundantly supplied with it. The larva of the goat-moth, (*C. ligniperda,*) so injurious to the wood of the elm, is largely supplied with fatty matter, and the common cockchafer, (*M. vulgaris,*) so destructive in some districts (both in its larval and pupal states) to vegetation is abundantly furnished with fat and oil. In M. de Tschudi's treatise "On the Destructive Insects and on the immense Utility of Birds," it is stated that "16 measures of cockchafers yield six of oil, and that a fair sort of cart-grease may be made from them." It must be remembered that sometimes these insects are collected by cart-loads.

A few words will suffice to show the practical bearing of the foregoing researches upon the question we are investigating. Most animals, whether man or brute, if well fed and deprived of their natural amount of exercise, have a tendency to produce fat, the wear and tear of tissue being reduced, and the quantity of carbon required for the respiratory and heat-forming functions being considerably in excess. The assertion of Liebig, however, that wild animals are not inclined to fatten, is not correct. I could give many examples of animals in foreign countries. Lieutenant Burgess, whose interesting papers on some of the Indian birds are published in the "Proceedings of the Zoological Society," tells me that he has not unfrequently shot very fat birds in India; and I could greatly multiply the instances I have already given in our own country, both as regards birds and quadrupeds, excluding, of course, the hybernating animals in the autumn.

On the Form, Length, and Weight of the Viscera of some of our Domestic Quadrupeds and Birds; and on the Best and most Economical Methods of Fattening these Animals.

Let me briefly consider the form and length of the digestive apparatus, and the secretions poured into it in some of our domestic animals in connexion with the deposit of fat, and I will take the ox as the best illustration. First, we have a stomach of enormous capacity: that of a bull that I examined held 20 gallons of water, and I have known more than 6 bushels of turnips taken out of the stomach of a working ox that was "blown." The intestinal canal of the ox measures from 120 to 140 feet; the salivary glands about the mouth furnish several pounds of saliva daily; the liver probably from 20 to 30 lbs. of bile; and the pancreas, (lower sweetbread,) about 10 or 12 lbs. of pancreatic juice. Besides these fluids, which are poured into the digestive tube, the stomach and intestinal glands and mucous surface supply a large amount of secretion, the quantities of which have been variously estimated by different physiologists. The viscera of the ox I find weigh in ounces about as follows:—Lungs, without windpipe, 128; heart, 80; liver, 240; pancreas, 15; spleen, (melt,) 30. The kidneys do not go with the offal. In the sheep, as I have stated in my "Essay on Lamb Disease," vol. xi. p. 88, the alimentary tube varies from 109 to 117 feet. The viscera in ounces are about the undernamed:—Lungs, 22; heart, 9; liver, 40; pancreas, 2½; spleen, 3. In ruminants, in addition to the large stomach, the projecting villi and folds of the lining membrane increase the absorbing surface to an enormous extent. In the pig the stomach is less complicated, but not resembling, as is often stated, that of man. The length of the digestive tube is from 70 to 90 feet; the viscera, in ounces, about the following:—Lungs, 24; heart, 8½; liver, 56; pancreas, 6; spleen, 5. These numbers are the averages of many that I have weighed; as regards the length of the alimentary canal much will depend upon the age of the animal, and I may remark that in all fat animals the viscera are relatively small. The length of the intestinal canal of the horse varies, I find, from 80 to 108 feet. In our domestic and game birds, the length of the digestive tube, including the appendages, is given in inches:—Cock, 94 to 110; hen, 84 to 90; turkey, 105 to 120; guinea fowl, 76; pheasant, 74 to 90; gray partridge, 46; capercailzie, 206; red grouse, 76; wood pigeon, 115; goose, 120 to 140; tame duck, 111; wild duck, 86. The above are entirely from my own measurements.

The same secretions as those named in quadrupeds are poured into the digestive tube of birds: viz., salivary, biliary, and pancreatic; but the salivary secretion is much less, being compensated for by the large amount of glandular secretion anterior to the gizzard. I may remark that the fattening propensities of an animal do not depend altogether on the length of the alimentary canal; thus, in an old giraffe that I examined, the intestinal tract attained the great length of 254 feet. In the Tasmanian wolf, however, before mentioned, the digestive tube measured only 6 feet 6 inches, not much exceeding double the length of the body. The giraffe was devoid of fat, but the wolf, an animal-feeder, was abundantly supplied with it.*

* "Proceedings of Zoological Society," 1855–1864.

Before I speak of the best and most economical methods of fattening the ox, sheep, and pig, let me bring to the notice of the reader a few facts connected with the rapid deposit of fat in some of the smaller animals, that may serve as sign-posts on the way. Some of the best examples in this respect may be adduced among birds and animals that have a higher temperature and a more rapid circulation than quadrupeds.

The turkey has, by artificial, unnatural feeding, reached the enormous weight of 36 lbs., and three geese were exhibited at the Birmingham Show, 1854, that averaged more than 26 lbs. each. The Aylesbury duck, too, has reached the weight of 12 lbs. The most approved method of fattening the first-named bird in Norfolk, as I am informed, is by thick barley-meal, adding bean-meal occasionally, keeping at the same time a good supply of brick-dust in the coop, of which the birds will eat a great deal: they are also kept in a dark place, and let out for an hour each day. The system varies somewhat with different people: thus some add suet to the barley-meal. I believe the absence of light, as one of the means of fattening the ox and the pig, is not sufficiently appreciated by the agriculturists of the country; and, without adopting the cruel practices that have been resorted to by some, and at the mention of which every Englishman will be disgusted, buildings might be constructed so as to admit only a very moderate amount of light, and at the same time be properly ventilated. In a recent article on Obesity by Dr Foissac, *L'Union Médicale de Paris*, March, 1864, it is stated that "the farmers of Bresse put out the eyes of their poultry to fatten them," and other authorities assert that the feet of geese have been nailed to the bottom of the coop, that they might be more readily fattened. It is likewise said that the wild hog of India will only fatten in confinement when its eyelids are sown up, its restless disposition being corrected by this means. But one of the most remarkable instances of the effect of inordinate and artificial feeding is exhibited in the ortolan, (*Emberiza hortulana,*) a small bird not unlike our yellow-hammer. The habit of the bird is to feed at sunrise. According to Playfair, the ortolans are placed in a warm chamber perfectly dark, with only one aperture in the wall; their food is scattered over the floor, and at a certain hour of the morning the keeper of the birds places a lantern in the orifice of the wall. This induces the birds to believe that the sun is about to rise, and they greedily consume the food. The lantern, after three or four hours, is again used, and repeated four or five times daily, so that the birds, instead of getting one full meal daily, are supplied with five or six, and in a few days become like little balls of fat.

In the next part of my subject I shall not presume to dictate to the practical farmer, whose knowledge of the best methods of fattening our domestic animals is much superior to my own, although the old adage of "Doctors differ" is quite as applicable, I think, to the cultivators of the soil. My object will rather be to place certain common-sense matters (as I believe) in a small compass before the reader, so as to refresh his memory with *principles*, rather than with practical information.

In fattening an animal—ox, sheep, or pig—the important requisites are rest and quiet, a moderate temperature, a clean bed, subdued light, proper ventilation, a good supply of water, the destruction of parasites, epizoa, (by brush, currycomb, or other means,) and the selection of food that contains the nitrogenous and non-nitrogenous elements in due and proper proportions, so as to obtain an adequate supply of the flesh-forming and fat-forming materials; the food should be given at regular intervals, and in such quantities that none may be left.

Among the watery foods are turnips, mangold-wurtzel, carrots, potatoes, cabbage, tares, lucern, and the natural and artificial grasses: whilst in the dry foods a more extensive bill of fare presents itself, such as linseed—boiled, crushed, or in cake; cotton, rape, and poppy cake; bran, wheat, barley, oat, pea, and bean meals; Indian corn, malt-combs, locust-beans, lentils, lupines; hay, clover, and straw-chaff. Treacle and sugar, to the amount of from half a pound to a pound, daily, may also be profitably added in some instances, and I believe the addition of some carminative seeds or oil, such as cummin, aniseed, and caraway, would often have a good effect. Vegetable bitters, too—as gentian, quassia, wormwood, and hop—I think might frequently be employed advantageously. I am not aware that their use has ever before been recommended, but they would probably give a "fillip" to the stomach, and excite it to take a larger amount of food. Salt, yeast, and other additions, have been recommended by some feeders.

In looking at the composition of the different kinds of food that I have enumerated above, it is necessary to bear in mind that the roots, vegetables, and fresh grasses contain from 85 to 93 per cent. of water; that these, with the exception of

the dry, natural, and artificial grasses, which contain about 1½ to 2 per cent. of fatty matter, have but very little fat in them; that the meals and cakes contain from 7 to 14 per cent. of water; and that the percentage of fat contained in the undermentioned articles of food is about as follows, the proportion of course varying somewhat in different samples:—Flour, 1·2; Indian meal, 7·7; peas, 2; beans, 2; rice, 0·7; barley, 0·3; potatoes, 0·2; cotton-seed, 23·50; rape-cake, 11; linseed-cake, 12.

The percentage of sugar contained in the following articles of food is about as under:—Wheat, 5·5; rye, 3·74; beans, 2; peas, 2; potato, 3·2; sweet potato, (*Convolv. Batatas,*) 10·20; Jerusalem artichoke, 14 or 15; beetroot, 10; sugar-cane, 20.

Of the albuminous and flesh-forming materials beans contain 31 per cent.; peas, 22; lentils, 33; oats, 11; barley-meal, 14; hay, 8; turnips, 1; carrots, 2; red-beet, 1½; potatoes, 2. The above are taken from different authorities.

In selecting the above foods, as has been fully explained by various writers, much must depend upon the locality, the nature of the crops, the age of the animal, the state of the market, and other circumstances, that the feeder only can determine. The quantity of live weight produced by a given amount of food has been estimated by several investigators. Thus it is said that 150 lbs. of turnips will produce a pound of flesh; according to Mr Lawes, ("Journal of Royal Agricultural Society," 1862, p. 215,) 100 lbs. live weight of fattening ox should produce 1 lb. increase per week, the animal taking 12 or 13 lb. of dry substance to produce it. In a fattening sheep, 100 lbs. live weight should yield 1¾ lbs. of increase per week, the animal consuming 15 or 16 lbs. of dry food. In a fattening pig, 100 lbs. live weight should yield 5 or 6 lbs. of increase per week, 26 to 28 lbs. of dry food being taken to produce it. So that for 1 lb. increase of oxen, 12 or 13 lbs. of dry food are required; for a sheep, 9 lbs.; and a pig, 4 or 5 lbs.

For other information respecting the rate of increase, I refer the reader to the various papers of Dr Gilbert and Mr Lawes, to the communications of Messrs Childers, Coleman, McDoual, and Templeton, in the "Journal of the Royal Agricultural Society," and to articles on the same subject in other journals.

I will say a few words on the feeding of the pig. This animal in a wild state eats a large amount of animal food; few things in the shape of snakes, lizards, frogs, and smaller animals, come amiss to him. In some districts in America he has cleared the country of rattle-snakes. A few years since it was discovered that a man in Paris was feeding a large number of pigs on horseflesh, and some of the Government officials interfered, believing that the meat was not fit for human food. I have reason, however, to believe that the introduction of a small quantity of animal food will be beneficial during the fattening process. To show how much the quality of the flesh is influenced by the nature of the food, a gentleman of my acquaintance had some pigs near to a salt-water river, where there was a great mortality among the eels (conger and common.) The swine for some time ate largely of these and fattened well, but the flesh was so fishy, that, when the pigs were sent to London, the salesman was obliged to return the money. One of the most curious examples that I have met with of pig-fattening is recorded in the *Leeds Intelligencer*, August, 1850:—"Mr Outhwaite fed a pig on rum and new milk, and in ten days it increased from 37 stone 10 lbs. to 42 stone 12 lbs., drinking three tumblers of rum daily, and being constantly intoxicated." This animal when fed on milk and ale did not increase so rapidly.

On the Supposed Injurious Effects Produced by the Excessive Obesity of the Ox, Sheep, and Pig.

A great outcry has been raised of late against the supposed cruelty and injurious effects occasioned by the excessive deposit of fat in some of our prize animals. I confess that I am unable to see the force of the objections that are generally urged against the system. Mr Gant in 1858, in a pamphlet extensively circulated among the press, "On the Overfeeding of Prize Cattle," dedicated to the Agriculturists of Great Britain, &c., says, in 1857 he saw at Smithfield Cattle Show oxen, sheep, and pigs, of an enormous size as compared to their age; and he adds, "when he contrasted the enormous bulk of each animal with the short period in which so much fat or flesh had been produced, he naturally indulged in a physiological reflection on high pressure against time, which certain vital internal organs—as the stomach, liver, heart, and lungs—must have undergone at a very early age, and on microscopical examination he found in the heart and in other parts muscular fibre replaced by fat," &c. I can scarcely conceive a greater amount of enjoyment among the lower animals than these brutes experience, in the good feeding they take to bring them

into this condition; and their constant state of rest prevents, as I believe, anything approaching to cruelty. The breeding of an animal is tested, to a great extent, by the quantity of fat that can be put on its carcass in a short time; and he who can bring an ox at the age of eighteen months to the same weight as formerly was attained in four years, I think, in the present increasing state of our population, is doing a good service to the public. I scarcely need say that an ill-bred animal will eat as much or more food, and the rate of increase will be much less. Fat, moreover, is a valuable article of diet; for, a poor woman with a large family can make a pound of fat go further than the same weight of lean: and, on the score of health, I believe no objection can fairly be urged against the meat of these obese animals. It is not pretended that this large accumulation of fat is *directly* remunerative to the feeder, but indirectly it is beneficial to him and to the public also, by showing the breed, value, and quality, of the animal.

Professor Brown, in the last number of the "Journal," takes objection to the forcing system, especially as regards the artificial induction of disease. I fail, however, to discover the practical nature of this objection. I have made inquiries among extensive breeders and feeders of cattle, and I cannot learn that fat, stall-fed animals are more liable to disease than lean ones. On asking a large grazier lately which were the most healthy—the fat or lean animals—his reply was "the fat beasts." Again, in the report by Professor Gamgee, "On the Health of Stock, 1863," not one of the 250 communicants speaks of disease specially in fat cattle. I can find no disease which they are particularly prone to, with the exception of splenic apoplexy, an affection, as I stated in a former paper on that subject, that more especially attacks animals that are fat or suddenly repleted. From the more isolated position of beasts in sheds, I believe that they are less liable to pleuro-pneumonia or foot and mouth disease than lean animals, that are more exposed to contagion and to depressing causes. There is one curious affection that I have found in fat animals, sheep especially that are fed largely on beetroot and oilcake. They are subject to a crystalline deposit in the bladder, that blocks up the urethra (the urinary passage), and thus occasions death. I have known many very valuable rams die from this cause. I have also met with cases of jaundice from gall-stones in sheep and oxen, from the large amount of saccharine matter contained in their food. It is a curious fact, that London cows that are fed much on grains are not unfrequently affected with these concretions in the gall-bladder, whilst grass-fed oxen never have them. A useful hint to those who are troubled with these calculi.

My essay has so much exceeded its intended limits, that I have been obliged to omit the record of my experiments, and of other matters that must be for the present deferred.

42 Beaufort Street, Chelsea, 1864.

SHEARING MARKET SHEEP IN WINTER.

(*From the Times of February* 20, 1865.)

Clerkenwell.—On Saturday, Mr William Pratt, a sheep salesman at Oxford and the Metropolitan Cattle Market, appeared to an information laid against him by Mr Love in behalf of the Secretary of the Royal Society for the Prevention of Cruelty to Animals, which charged him with "having cruelly ill-treated certain sheep at the New Cattle Market, by exposing the same for sale when shorn of their fleeces, thereby contravening the Statute 12th and 13th of Victoria, cap. 92."

Mr Ricketts, solicitor, of Frederick Street, Gray's-Inn Road, prosecuted; Mr Stammers was for the defendant.

Mr Ricketts said that the Society was aware that, in taking these proceedings it was placing itself in antagonism to a very large body of graziers and others, whose interests it immediately affected. One thing was certain, that if the law were ever put in force against the salesman the practice must sooner or later cease.

Mr D'Eyncourt said it appeared to him that the case must fail at the outset, as the wrong person was before him. The grazier or farmer who sent the sheep up should be proceeded against, not the salesman.

Mr Ricketts said that before the grazier could be brought forward, it would be necessary to find out who he was, and where he was to be found, and there was more

difficulty in that than the magistrate might imagine. It was very difficult to get hold of the owners; for if the salesmen, the drovers, or any one else in connexion with the market, were asked to whom the animals exposed for sale belonged, their invariable answer was, that they did not know.

Mr Love said the most strenuous endeavours had been made in this case to find out the consigners, but without success.

Inspector James Rutherford, an officer in the employ of the Royal Society for the Prevention of Cruelty to Animals, described the state in which he saw the sheep on the 20th of January, which were standing without cloths, shivering, shaking from head to feet, and their backs set up in the form of an arch. He told the defendant he ought to have cloths on the sheep on such a cold and wet day, and a short time afterwards some cloths were put on.

Inspector Joseph Dobie, an officer in the employ of the Society, and Police-constable Floyd, 449 A, corroborated the inspector.

Mr George Tegg, veterinary surgeon and inspector to the Metropolitan Cattle Market, saw the sheep trembling and suffering from the weather. They suffered pain from having been clipped and then placed in an open market. The effect of the cold would be death to a great many. Sheep thus exposed died of inflammation of the bowels. The slaughter-men call them "chilled sheep."

Professor Charles Spooner, chief of the Veterinary College, had heard the evidence of the witnesses. He considered the expansion of the nerves of the skin of the animal consequent upon the removal of the wool, which was the natural covering, would have the effect of producing very serious suffering. An aching pain was produced from exposure to the cold. If you took the natural covering from an animal, you exposed all the nerves of the skin, and the blood was prevented from proper circulation. He had not the least hesitation in saying that the mutton was influenced, and that it was affected in the taste. It was less palatable. The putting cloths on sheep would mitigate the evil, not altogether prevent it.

Mr Arthur Cherry, veterinary surgeon to the Metropolitan Police, gave similar evidence.

Mr Stammers, for the defence, said the practice now complained of was not a matter of a few days or months, but had been the practice of the farmers of this country from time immemorial. If the Legislature had intended that sheep should not be shorn and sent to market in that state, it would have stated so; but the 2d section of the 12th and 13th of Victoria, cap. 92—the Cruelty to Animals Prevention Act—did not say anything of the kind; and he should call witnesses to prove that the sheep did not belong to the defendant, but were consigned to him.

William Pratt said,—I am the son of the defendant, and I assist my father in his business. The sheep in question were not my father's sheep, but they were consigned to him.

Cross-examined by Mr Ricketts.—My father had 30 clipped sheep in the Metropolitan Cattle Market on the 26th of January last. I do not know who consigned them. [The witness refused to answer the question who consigned the sheep several times, and said he was not prepared to do so.]

Mr Ricketts said he was determined to have an answer to the question, and if an answer was not given he should ask the magistrate to commit the witness for contempt of court.

Mr D'Eyncourt ruled that the witness must answer the question.

The witness then said the sheep belonged to Mr Thomas Acres, of Black Bourton, near Oxford, and that he saw the sheep in Oxford market the day before they were brought to the London market. They were brought to London in covered vans.

Mr Henry James Honeybull, a butcher in Queen's Crescent, Haverstock Hill, purchased 10 of the sheep, and they were in very good condition. They were not chilled at all. They were killed the same day, between 4 and 5.

Mr D'Eyncourt said, that even if the case had been proved against Mr Pratt, he would not have inflicted a fine, owing to the long practice. The evidence was so strong, however, that if another case of the kind were brought before him he should feel inclined to convict. His own impression was that the salesman was bound to sell the sheep, and that if he was careless in the business he, to a certain extent, participated in the cruelty, although the consigner was most to blame.

Mr Ricketts.—Do I understand you to say the salesmen are not liable?

Mr D'Eyncourt.—Sufficient for the day is the evil thereof. Every case must rest on its own merits.

Costs were applied for and refused.

"FOOT-ROT" IN SHEEP; WITH OBSERVATIONS UPON THE ALLIED DISEASES IN OTHER ANIMALS.

By G. T. Brown, M.R.C.V.S., late Veterinary Professor in the Royal Agricultural College, Cirencester.

Upon the cause and nature of "foot-rot," as of many other diseases affecting agricultural stock, much conflicting evidence exists. By some it is considered to be malignant, developing during its progress a peculiar poison or virus, which is capable of producing the same disease, by inoculation in a healthy foot. Other observers deny the contagious property, and refer the spread of the disease to the general prevalence of the cause in the locality where it may exist. By some it is considered to be identical with "canker" in the foot of the horse, and "foul" in the foot of the ox; while others claim for it certain specific characters which render it distinct from either of these diseases.

Among the defenders of the malignant nature of the disease is M. Vidal, who narrates the following circumstances:—

On the 4th of September 1824, he had never had "foot-rot" in his flock, consisting of 46 ewes and 2 rams. He lent one of his rams for the purpose of breeding. The animal was put among a flock the greater part of which were affected by the disease. On the 17th day of October the ram was returned very lame. M. Vidal knowing nothing of the "foot-rot," and paying no attention to the lameness, placed him among his sound flock. On the 11th of December, sixteen of them had evidently contracted the disease. In April 1825, after renewing his flock, he cautioned his shepherd not to allow the sheep to pasture with those of other persons. The man neglected the caution, and the sheep mingled with another flock among which "foot-rot" was general. On the 11th of May there were six sheep affected with the malady."

M. Pictet says a flock of sheep, labouring under "foot-rot," was driven into the neighbourhood of a Spanish flock. The straw upon which they had lain was not taken away, and the Spanish flock, having afterwards been sent into the pent-house, the "foot-rot" began to show itself among them in about fifteen days.

Gasparin goes so far as to assert that "foot-rot" extends, not only to the healthy sheep of the flock, but also to pigs, dogs, and poultry.

Authorities, numerous and respectable enough, advance instances of its communication from a ram to the ewes. Even the passage of infected sheep over a farm is alleged to have established the disease. The crowning argument, however, is reserved by those who maintain that the sod, on which a diseased foot has trodden, will convey the affection to a healthy organ.

Inoculation has been practised experimentally, for the purpose of deciding the question of contagion, a portion of the matter from a foot suffering from "foot-rot" being introduced by incision, or kept in contact with a part of the foot from whence the horn had been previously removed. In some cases a similar disease has followed.

In one recorded experiment 20 sheep, out of 32 inoculated, took the disease. One sheep seemed to possess a remarkable immunity; and the operator, with a perseverance that might have been exerted more advantageously in some other direction, repeated the inoculation *seven times* before the result was obtained.

The opponents of the contagion theory have by far the most difficult task, because, setting aside the difficulty of combating a strong prejudice, it is not easy to prove that a disease which rapidly extends through a flock is not so transmitted by virtue of its contagious character.

Instances are advanced to show that animals suffering from "foot-rot" may be associated with healthy sheep without any extension of the malady. Inoculation has also been tried, and failed, in a number of cases; and smearing the matter over the hoof or sound skin, has not been found to produce any disease.

Most of the information conveyed to us comes from men who were not acquainted with the characteristic elements of the disease, and who seem to have recorded effects irrespective of their possible causes, giving, in place of logical inductions, the mere impressions which the facts made on their own minds at the time of their occurrence. The only direct evidence bearing upon the question refers to inoculation, and the conveyance of the disease by an infected animal to a perfectly healthy locality. On both these points the results recorded by different observers are opposed. The facts ad-

vanced on one side prove that the disease will spread from a diseased sheep to healthy animals in a previously healthy situation; and further, that direct contact of a healthy foot with the matter of a diseased one, will induce the disease. The facts on the other side prove that a diseased sheep may, with impunity, be allowed to mingle with healthy ones *on a dry soil;* and that contact with the matter of "foot-rot" is not injurious unless the healthy foot has been previously denuded of a portion of its horny covering.

So far, therefore, as the evidence is concerned, the question of contagion has yet to be decided; but before any consideration can be given to a point of such importance, it must first be determined what is the nature of the disease in respect of which the question arises.

NATURE OF "FOOT-ROT."

Concerning the essential characters which distinguish "foot-rot" from other affections of the foot of the sheep, very little appears to have been ascertained. Should farmers consider this admission a reflection upon veterinary science, they are requested to pardon the suggestion that veterinary science has had very little to do with the matter. The great authority always has been the shepherd, whose assertion of the presence of "foot-rot" or other disease in the flock is not likely to be questioned. Nor is veterinary science appealed to unless the consequences of the malady are especially serious. In many instances a diseased state of foot is constant on particular lands; remedies are systematically applied with an average amount of success, and there is no doubt at all felt about the character of the disease, or its origin, nor of the infallibility of the secret nostrums used for its cure. Whatever the disease is, it arises from some peculiarity in the land on which the animal is placed; and it is calmly reckoned among the annoyances associated with farming. The shepherd is deputed to rectify the mischief as well as he can, and so the matter goes on year by year. In other cases a healthy locality suffers. A few instances of disease in the feet are noticed; probably the affection spreads; a new ram or some recently purchased sheep are first affected, and the verdict is, a touch of the "foot-rot," brought, of course, by the strangers lately introduced. No inquiry is instituted respecting the nature of the new disease; no one doubts the revelations of the oracle who speaks, and "foot-rot" it is decided to be. Possibly justly so; but, rightly or no, the conclusion is reached upon the shallowest of shallow premises.

To determine accurately the essentials of the disease, the inquirer will naturally select a locality where the affection is constantly present; and where, consequently, no sudden outbreak will interfere with his investigation. He will observe some animals to be lame, probably excessively so; even, it may be, incapable of standing, and compelled to graze with their knees on the ground. Between the extreme and the incipient cases he will distinguish various stages, defined to some extent, by the animal's movements. Some sheep will move with tolerable freedom, probably showing lameness in one leg only; others may manifest a slight defect in their action occasionally; and many will not indicate any disease until they are caught and examined.

According to the extent of the affection and the nature of the soil, the appearances will differ. In the most advanced cases the entire hoof may be detached; sometimes only a small portion is loosened, or, it may be, that certain hollows and fissures comprise all the changes that have occurred. The growth of the horn to an extraordinary degree, or its being worn down almost to the quick, cannot be considered essential elements in the disease. "Foot-rot" may exist in association with either state, and it may be absent in both. Either condition in excess will assist the development of the disease.

The excessively elongated and overgrown hoof causes an unusual strain upon the internal structures, besides being liable to fracture, which may expose the open canals of the horn, or even furnish a direct channel through which dirt may pass to the sensitive parts. Excessive wear, on the contrary, lessens the protective covering, and renders the horn more easily acted upon by moisture and grit.

The general preference for the fore extremities is not peculiar to this malady; and probably the extra weight thrown upon these parts may explain the prevalence of diseases in the fore feet of animals generally; "foot-rot," however, is not confined to the front feet—occasionally one hind one is attacked, and very rarely both suffer.

So long as the investigation is confined to the diseased animals, and includes only such a general observation, nothing of importance is gained. We ascertain, what has been long well known, that sheep affected with "foot-rot" are more or less lame; that some portion of the horn is loose; and that a soft fungoid exudation is quickly thrown out instead of the healthy horn structure. It will be further apparent that a

large number of animals are affected at the same time; and that on particular lands it is especially rife, although modified in some degree according to the season.

Excluding all speculations, these few facts comprehend all that can be gathered from a general examination conducted with a view to ascertain the extent of disease, and to determine the necessary means for its cure or prevention. Science, however, imposes a more arduous task. At the commencement it requires several problematical positions to be satisfactorily resolved:—

1. The precise nature of those structural alterations that have occurred in some of the tissues composing the foot.

2. The exact elements which distinguish "foot-rot" from other affections of the foot arising from disease or injury.

3. The character of the virus or specific poison, the contact of which with healthy structures induces the same disease.

Structural alterations can only be appreciated by comparison with healthy tissues. Accordingly, it becomes indispensable to examine the elementary constituents of those parts of the foot especially implicated before attempting a consideration of the elements of the disease.

Elementary Structure of the Tissues of the Foot particularly affected in "Foot-Rot."

The external appearance of the foot of the sheep requires no description, nor is it necessary to indicate the differences in the arrangement of the foot structures in other hoofed animals. For our present purpose it is of no consequence that the foot of the sheep is cloven, and that of the horse single. These points, which interest the comparative anatomist, will not help to elucidate the questions with which we are at present concerned.

One anatomical peculiarity of the sheep's foot, or, more correctly, of the parts connected with it, is the existence of a peculiar inflection of the skin between the digits, a short distance above the hoofs. This canal, called the "biflex," or "interdigital canal," is formed by the continuation of the tissues of the skin, including the hairs, and secretes a viscid fluid. Its functions are not apparent; but its opening being frequently blocked up by particles of dirt, a distension of the canal occurs by its own secretion, and much irritation and swelling follow. This condition may be superadded to "foot-rot," and considerably aggravate the disease; or it may occur altogether independently. It certainly has nothing to do with the origin of the disease, and will not, for this reason, be alluded to in the course of the subsequent discussion upon the essential elements.

The horny covering of the foot first presents itself to our observation. Externally we find it rough and hard; internally softer and more complicated in its arrangement, being beautifully adapted to the surface of the internal foot. We realise at once the idea that the hoof is a protective covering, capable of resisting the effects of concussion and attrition, which would be seriously detrimental to the more delicate tissues beneath.

This idea of a protective covering naturally becomes more extended as we comprehend the fact, that all free surfaces of membranes possess it. Every portion of the skin, as well as of the internal membranes, is covered by a layer, or several layers, of delicate cells, united by their sides and edges, without the intervention of any connective tissue. These cells are secreted from the structures beneath, and perform very important offices—that of protecting the sensitive tissues being probably the most important.

Rapidly produced, insensitive, and non-vascular, these "epithelial cells" are eminently adapted to preserve the more vital structures from the influences of constantly acting physical and chemical forces. An idea of their nature is readily obtained. A small portion of the outer skin of the hand, or any part of the body, examined by the microscope, will suffice to render them familiar.

After removing the several layers of cells which form the outer skin or cuticle, we come to the sensitive or true skin, or cutis, which is everywhere covered by minute elevations or papillæ, round which the cells of the cuticle are secreted. Keeping these facts in remembrance, we proceed to concentrate our ideas upon the foot. And first, with the recollection of the cells which form the protective covering of the skin and membranes, we examine the structure of the hoof, a small portion of which should be scraped off and softened in potass, for microscopic examination. The first glance convinces us that we have, composing the hoof-horn, the identical cells that we found covering the skin, agreeing in every respect so closely that there is no possibility of distinguishing the one from the other.

Pursuing the investigation, we proceed to make thin sections of the hoof in longitudinal and transverse directions, in order to see how these elementary cells are arranged in the compact horny structure.

A drop of potass placed on the specimen will produce a very peculiar and instructive effect. The concentric rings surrounding the openings will gradually resolve themselves into layers of epithelial cells. From this examination we arrive at the certain conclusion that the hoof corresponds in elementary structure and arrangement with the insensitive covering of the true skin—that, in fact, horn is identical with the cuticle or outer skin. Next, keeping in view the idea of a secreting, sensitive, and papillated surface, such as we find in the true skin, we may proceed to investigate the tissues beneath the horny covering. Reflected over the whole of the internal foot is a highly vascular membrane, everywhere presenting numerous papillæ. On the coronary surface, and over the sole, the papillæ are large and numerous. On that part of the membrane which is folded or lamellated, they are fewer in number, although distinct enough even under a low magnifying power.

Round the large papillæ of the coronet and the sole, layers of epithelial cells are secreted to form the wall and sole of the hoof. The cells being developed round the papillæ accounts for the cavities or canals which form the tubes, as they are termed. At their origin these canals are visible to the unaided eye, but in the densest part of the horn they are only perceived when highly magnified.

The minute papillæ in the lamellæ undoubtedly secrete horn, but not to the same extent as the papillated surfaces of the coronet and sole. It is evident, from the arrangement of the two structures, that the delicate horny lamellæ lining the interior of the hoof, corresponding to the lamellated membrane, arise from those vascular folds to which they are closely attached.

To our previous conclusion of the identity of the hoof with the cuticle or other skin we may now consistently add the fact of the evident connexion between the sensitive skin, with its papillated secreting surface, and the sensitive, secreting membrane of the internal foot, with its papillated surface; completing the proof of the identity of the true skin and its epithelial covering with the vascular membrane of the internal foot and its modified epithelium or horny covering. Under the membranous tissues of the foot there exists a quantity of fibrous structure attached to the bones forming the basis of the organ. Posteriorly the fibres enclose large fat vesicles, and form together a firm but very elastic cushion, modifying the effects of concussion to which the foot is, from its position, constantly exposed during the movements of the animal.

Being now acquainted with the healthy structure of the tissues which are particularly affected in "foot-rot," we may next consider those changes which are effected in the healthy textures by the progress of the disease.

The Precise Nature of the Structural Alterations that occur in some of the Tissues composing the Foot during the Progress of "Foot-Rot."

For the purpose of determining the elements of structural disease, the same minute investigation will be required that was found necessary to ascertain the arrangement of the healthy tissues. The hoof being obviously altered in some important particulars, will first require consideration. Small portions taken from various parts where the effects of disease are apparent, will present under the microscope very important evidence.

According to the condition of the diseased texture, our method of examination will be modified. Selecting the worst forms of the disease to begin with, we shall take a little of the soft, spongy, discoloured horn that is most easily scraped from the foot. A few particles of this broken-up structure should be placed on the glass slide with a little water, and examined under a moderately high power.

The appearance presented is precisely what the pathologist would not anticipate. Instead of the diseased products which he might reasonably expect, he finds nothing but the epithelial cells, characteristic of the healthy horn or skin, mixed with particles of dirt.

It will be noticed that the cells are less regular in form, and occasionally have slightly ragged outlines, but they are unmistakably epithelial cells.

Between the hoof of the healthy foot and the detached and broken-up structure from the diseased foot, the distinction lies in the physical condition of the elements. In the healthy hoof the cells are regularly developed in layers, and form a compact structure. In the diseased foot the hoof has been macerated in the fluids exuded

from the membrane, as well as by the moisture that may exist in the soil, until the cells are separated from their close connexion with each other; and, being mixed with the dirt and exuded fluid, form the mass which we invariably find in those parts of the hoof which have been most exposed to the combined action of these destructive influences.

In different parts of the same foot, and among different animals, we shall distinguish many grades of the disease, as it affects the horn of the foot. Some parts are only slightly broken or withered. In a white hoof a dark spot may be detected, indicating a hollow place. A very close examination may probably result in the discovery of a minute fissure from an eighth of an inch to an inch long, crossing the hoof transversely.

The importance of these seemingly trifling alterations of structure will be evident as we trace them to their terminations. Either or all of the changes may have taken place in the feet of animals that show no evidence of unsoundness in their movements; it is, therefore, only by examining the apparently healthy feet, that we shall discover the earliest indication of disease.

The shrivelled condition of the hoof is very peculiar; it commonly occurs at the toe, but any part of the outside edge of the hoof may show it. The appearance is suggestive of decay or death of the part, from the absence of the necessary nourishment, and the microscopic examination sanctions the idea. A section of the shrivelled part showed the canals of the hoof to be obstructed by an accumulation of minute particles of dirt, extending for some distance up the horny structure, and effectually arresting the course of the nutrient fluids.

The next condition indicated by the dark spot can only be readily seen when the hoof is light in colour; but the hollow, of which it is the evidence, may be suspected when the lower edge of the horn is broken at all or detached from the sole. A probe will at once detect the cavity when it is not sufficiently evident. In some cases the cavity will be found on section to extend only a short distance up the wall of the hoof; in others it will have reached nearly to the internal structure, and sometimes the penetration is complete, and the secreting membrane gives evidence of irritation by redness and the commencement of exudation. A section through the hollow part will render its origin very evident. From some small fissure or crack at the lower part of the hoof, the dirt has gradually passed upwards in considerable quantities, mechanically excavating the horn, and ultimately reaching the vascular structures. The pressure from below will suffice to force up the foreign particles in abundance, and the more the hoof is softened by moisture the more rapidly the structure will give way. Disease of the sensitive membrane of the internal foot will necessarily result from the irritation produced by the contact of the particles of sand or grit with its surface.

Insignificant as the next condition is, amounting to no more than a mere scratch upon the side of the hoof, it is, nevertheless, the most serious of all the primary changes in the horn. In every instance we have found the minute black line to be the entrance to a passage leading obliquely into the internal foot.

It would seem that minute particles have at first been lodged in some little ridge upon the outside of the hoof, and gradually insinuated themselves into the structure, passing between the layer of cells, and being assisted in their course by the slight outward bending of the horn of the foot during progression, the tendency of the animal's weight always being to bend the edge of the wall under, and thus cause a small fissure on the outside of the hoof to slightly expand, and allow the particles of grit to pass by degrees to the interior. This peculiar curving under the edge of the horn at the same time is injurious in another direction, permitting the accumulation of dirt underneath it, and assisting to force gritty particles up through the canals of the horn of the sole.

From the commencement of the changes in the structure of the hoof on to that most advanced condition where the integrity of the horn is entirely lost, it appears from the most careful and minute examinations, that the alterations are purely physical. In the early stages we find the horn shrivelled from the mechanical interference with the supply of nutriment, consequent on the blocking up of the canals or we discover fissures or cavities varying in extent, but always the result of disconnexion of the layers of epithelial cells, of which the hoof is composed, and the introduction of particles of gritty material.

In the advanced forms of the disease, the hoof is altered in appearance; its compact character is exchanged for a spongy or even rotten mass: but nevertheless the microscope proves that the changes are still only mechanical; the "rotten" mass

consists of epithelial cells very little changed in form, but separated from their connexion with each other, as though from the effects of long maceration, and commingled with the dirt of the soil and the exudative matter from the irritated secreting membrane, but presenting no new pathological elements, nor even the ordinary products of disease.

The condition of the secreting membrane next requires consideration. Rarely is this tissue the seat of ulceration in "foot-root." Cases have occurred in which all the foot structures have been destroyed, even the bone being extensively decayed; but in the few instances alluded to, there has been good reason to believe that the so-called "foot-rot" arose from puncture penetrating the bone, and causing caries of this structure first. Generally the first effect of the contact of foreign particles with the membrane of the internal foot is to increase the secretion of epithelial cells from the surface, and thus to furnish in some degree a protection to the subjacent tissues.

Covering the whole of the surface from whence the horn is detached, will be noticed a layer of the fungoid or spongy material; this under the microscope is found to consist of loosely aggregated epithelial cells, very abundant, and closely adherent to the membrane beneath them. The structure of the membrane is usually unchanged, and if we except the circumstances of its excited sensibility and increased vascularity, it can scarcely be said to be the seat of any disease at all. Its function of secretion, so far from being impaired, is particularly active; but the abundant and rapid development of the epithelial cells, with the exudation of serous fluid from the distended vessels, prevents the condensation of those elements into firm and healthy horn, and perpetuates the formation of the well-known fungoid growths, so characteristic of "foot-rot;" these fungoid growths, be it remarked, being nothing more than horn wanting in density and firmness.

The precise structural alterations which result from "foot-rot," so far as we can determine them, amount to the following:—

1. Mechanical derangement of the structure of the hoof and the introduction of gritty particles into the canals, or into accidental fissures.
2. Softening and disintegration of the horny structure by the moisture of the soil and the exuded fluids from the internal membrane.
3. Irritation of the internal membrane, causing excessive secretion of epithelial cells with serous exudation, associated with increased vascularity and sensibility.

If we were only in possession of evidence referring to the advanced stages of "foot-rot," it would be difficult to decide from the condition of the parts whether the internal membrane or the horny covering was the primary seat of the derangement; but with the facts which we have obtained from an examination of the incipient as well as the advanced stages, there is sufficient reason to believe that in most instances the integrity of the hoof must be impaired before the internal membrane can be injured. Many of the changes previously described affect the hoof to a considerable extent, while the secreting membrane remains perfectly intact.

Such alterations of structure as we have found to exist in the various stages of "foot-rot," are sufficiently marked to be easily recognised; we shall therefore find no difficulty in solving the next problematical position which requires solution.

The Exact Elements which Distinguish "Foot-Rot" from other Affections of the Foot of the Sheep, or other Animals, arising from Injury or other Causes, not claiming to be "Specific" in their Nature.

As far as appearances go, it must be at once admitted that the changes indicative of "foot-rot" are commonly seen in the feet of other animals. In fact, whenever solution of continuity in the horny covering occurs, the entrance of particles of dirt is a necessary consequence; and in succession the occurrence of those structural changes that have been described.

In thrush of the horse's frog; in canker of the foot of the same animal; in cases of neglected puncture; in instances of corns which have been neglected; in the foot and mouth disease of cattle and sheep, when the feet have not been attended to, similar appearances are present, including softening of the horn in the exuded fluids, the admixture of particles of dirt, and the growth upon the membrane of the spongy material consisting of the structural elements of horn loosely arranged, but presenting all the characters of the normal constituent of the structure.

If there are distinctive elements in any of these diseases, the present means of examination are not sufficient to enable us to detect them. Whether we take "foot-

rot," or canker, or thrush, or foul in the foot of the ox, or corn in an advanced stage, or the diseased products arising from injury, the microscope fails to indicate anything characteristic of either disease after the changes have so far advanced as to present a general resemblance; that is to say, where the hoof-horn has become spongy or rotten, and the secreting membrane is covered with fungoid growths. Whether these conditions be expressed by the term "canker," "thrush," "foot-rot," or "foul," or by other equally unmeaning and vulgar titles, it is necessary to insist upon the fact that the pathological elements of the structural changes are identical.

It will not be understood that every instance of corn, or punctured foot, of necessity shall present the appearance of "foot-rot" or "canker;" on the contrary, it is admitted to be necessary that the injury or disease shall be neglected, that the defective part shall be exposed to the influence of dirt and wet before the changes in the structure of the hoof and the function of the membrane will occur; but when they have occurred,—when the hoof or parts of it are soft and spongy, or black and rotten, —when the membrane is throwing out an abundance of epithelial cells,—then the apparent resemblance in all these differently-named diseases is proved by the microscope to be a true identity, and justifies the assertion that there are none of the products of "foot-rot" which are not common to other affections of the foot hitherto presumed to be entirely distinct from it and from each other.

The third position which we have undertaken to discuss will require but little consideration. It refers to the "virus" of "foot-rot,"—the animal poison supposed to be capable of inducing the disease by contact.

The question of the existence of such poison among the products of "foot-rot" must be determined by experiment; and the only foundation for the assumption of "virus" lies in the fact that the introduction of the matter from a diseased foot to the healthy foot by puncture through the horn has produced "foot-rot" in some cases, although it has failed to do so in others.

After all, the fact may be admitted without any question; it proves very little; we are quite prepared to learn that an injury to the horn of the foot, followed by the contact of a mixture of moist epithelial cells and particles of dirt, will, if applied sufficiently long, produce "foot-rot;" we know that dirt and moisture will suffice, without any additional elements.

Some of the experiments in inoculation failed, probably because there did not happen to be enough of the gritty particles; others because they did not remain long enough in contact with the membrane to establish any irritation; and at best there was not so much disease produced as would have occurred if the animals had been placed upon undrained land, where there happened to be a tolerably plentiful admixture of sand or grit in the soil.

If it had ever been found that the introduction of the matter under the skin of the leg or any part of the body produced the disease, there would be fair evidence of its specific nature; but, in the absence of this proof, we cannot admit an assumption which is altogether unnecessary to explain the results.

From the present state of the argument we may consistently deduce the conclusion, that "foot-rot" is primarily consequent upon such a derangement of the structure of the horn as permits the introduction of foreign particles, which ultimately reach the internal membrane, and occasion irritation, followed by exudation and excessive secretion.

Origin of "Foot-Rot."

Wherever the conditions of moisture and grit exist, on the same lands "foot-rot" may be expected to be rife. Whether the land be light or heavy seems to matter but little; the stiffest undrained clays and the lightest of undrained sandy or chalky soils, are equally active in the production of the disease, which is consequently tolerably general in its distribution.

It is usually admitted that "foot-rot" is unknown where the soil is efficiently drained; it is certainly well known on soils which are so porous that the idea of drainage is scouted, on the plea that the land is never wet enough; although we have had the satisfaction of hearing these reasoners admit that in the dryest seasons on such soils the disease is less prevalent.

The rapid extension of "foot-rot" among the flock is easily explained where all are exposed to the same influences. If there is sufficient wet to soften the horn and dilate the canals, it is only necessary, further, for gritty particles to be present to complete the requisite conditions for the production of the effects we have been considering: no more active virus is wanting than exists in the shape of wet and dirt.

In instances recorded of the spread of the affection on previously healthy lands from one or two diseased subjects, we have the usual difficulty, viz., ignorance of all the conditions; nothing can be gained by endeavouring to combat such positions, or indeed to defend them. If they are facts, they are met by equally authentic instances of a totally opposite character; therefore, whichever view may be taken, there are facts recorded in contradiction.

All the evidence obtained by investigation tends to prove that "foot-rot" only spreads under the influence of causes which act mechanically upon the structures, and are not in any way connected with the development of a "specific" virus.

Treatment and Prevention.

It will not be necessary to insist upon the importance of perfect drainage; but, looking upon the affection independently of the continuance of the causes which give rise to it, the question occurs, Can any remedies be applied to ameliorate or cure it while those causes remain?

Experience decides in the affirmative: indeed, so little difficulty attends the treatment that every shepherd has an infallible application, which certainly often succeeds in curing the affection about as fast as it is produced, so that an average number of cases will always require attention. This may be considered as a normal state of affairs on lands which give "foot-rot."

The routine is perfectly simple. Each sheep that indicates by his lameness the necessity for treatment is caught, and the detached or decayed horn of the foot pared off by a strong somewhat curved knife; sometimes the entire hoof requires removal in this way. In the next place, the exposed surface is painted over with some caustic mixture, by means of a feather or brush.

The rationale of the process seems to be the destruction of the extreme sensibility of the membrane and the production of an astringent effect upon the relaxed and distended vessels, and the condensation of the epithelial cells to form the compact horny texture which is required. The addition of some medium, as tar, for the purpose of temporarily protecting the parts while the new horn is being secreted is an important part of the treatment.

For the cure of severe cases caustic dressing appears to be indispensable, and generally very powerful agents are desirable. Various preparations are in favour, but they may nearly all be included in one class.

Among the most valuable we may name a mixture of nitrate of mercury with hydrochloric and acetic acids. Sulphate of copper, with tar, is preferred by some; and recently the preparations manufactured by Dr Calvert of Manchester, under the name of Phenyline and Terebane, have been advantageously employed as caustic dressings for "foot-rot" in sheep and the allied diseases in the feet of other animals.

The preparation of the nitrate of mercury is the most powerful, although its action can be modified by dilution. In its concentrated form it produces intense pain for a time, evidently followed by diminution of sensibility; and in the course of a few hours after the application the animal will stand apparently without suffering, even when the entire horn has been removed from both fore feet.

The compound is made by dissolving two drachms of metallic mercury in two ounces of nitric acid, then adding an ounce each of hydrochloric and acetic acids, and diluting with four to twelve parts of water, according to the degree of action required.

To arrest the development of the malady, or to prevent its occurrence, by any means which can be devised to render the feet less susceptible to the action of the deleterious influences to which they are of necessity exposed in certain localities, is of more importance than the treatment of the disease in its worst forms.

By systematic examination of the sheep among whom foot-rot is prevalent the primary symptoms may be detected, and by regular preparation of the hoofs they may be kept in a condition least favourable to attacks of the disease. In order to effect this object the surface of the hoof must be kept, as far as possible, free from ridges, or hollows, or fissures; and all unnecessary extension of the edges of the hoof must be carefully prevented. A great deal has been and is still urged against the use of the rasp and drawing-knife upon the foot of the horse; the frogs in particular are held especially sacred from either instrument. Observation, however, has led us to conclude that error may exist in both directions, and that however injurious the excessive use of the knife may be, the neglect of it is not less so.

Every loose portion of horn, should, at the very least, be removed, and every fissure or hollow capable of holding dirt should (particularly in the frog) be levelled, and the surface rendered smooth. In animals whose feet are much exposed to dirt

and moisture, and where no great attention is paid to them in the stable, a neglect of these precautions leads to the development of those diseased conditions that we have considered as allied to "foot-rot" in sheep. The horn of the sheep's foot on moist or light soils is very little, if at all, worn. The edges of the wall curve under and form receptacles for dirt; ridges and fissures and cracks are left untouched, and the very natural results follow. If every sheep, before being placed on lands known to produce "foot-rot," had his feet properly prepared and periodically attended to, the number of cases of disease, even with the continuance of its causes, would be reduced to a minimum.

No particular skill nor any large amount of labour would be required to effect all we desire. The shepherd being furnished with a small rasp, a strong curved knife, and a small point or awl for picking out the dirt from minute fissures, would be expected to hold the animals successively between his legs, and first cut off with his knife any elongation of the edges of the horn until the sole of the foot is rendered perfectly flat and level. Next, rasping the hoof generally over the outside, he will examine the clean surface to see if any cracks, or fissures, or hollows, or shrunken parts exist; if they are found he proceeds to excavate by knife and rasp until he reaches the bottom of the cavity or removes the whole of the decayed structure; afterwards applying a little tar to protect the parts, or using some stronger dressing if he finds the condition of the foot renders it necessary. Supposing the horn to be found quite perfect, it will still be advisable, after the surface has been rendered sufficiently smooth, to apply a coating of tar to prevent the immediate action of the moisture and grit of the soil upon the exposed surface of the hoof.

A little extra expense and trouble would enable the operator to use a more adhesive material than tar as a protection to the feet after the use of the rasp and knife. Various mixtures of pitch, resin, and tallow, with a small proportion of gutta percha, might be melted together, and applied warm with the greatest advantage.

The repetition of the process of rasping and paring the feet and applying some external protective agent will be necessary according to circumstances. The nature of the soil and the character of the season will have an essential influence; but, under any circumstances, once a month will be quite sufficient; and we have practical authority for saying that it would answer in a commercial sense to devote that amount of labour to the accomplishment of so important an object as the amelioration or prevention of the disease.

It may be accepted as a fact beyond all question, that if by any means the integrity of the hoof can be preserved, "foot-rot" will become an extremely rare disease; although we do not, under any circumstances, anticipate its extinction so long as an acre of land remains undrained.

New Cavendish Street, Portland Place, London, W.

CASE OF HYDROPHOBIA—DEATH—AUTOPSY.

(UNDER THE CARE OF DR OWEN REES.)

For the notes of the following extremely rare and interesting case we are indebted to Mr Wootton Bushell:—

Hydrophobia is a disease so very rare, that, Dr Wilks says, this is only the second case admitted into Guy's since his connexion with the Hospital. One little circumstance mentioned to us by Dr Wilks is not alluded to in the report. It is sometimes said of persons affected by hydrophobia that they "barked like a dog." It is generally believed that this statement is due entirely to the bystander's imagination. Now it seems that in this case the patient did occasionally make a strange explosive noise, which, although not like the bark of a dog, yet resembled it enough to account for the origin of the popular notion alluded to. The bite was several weeks before the symptoms set in. In the other case Dr Wilks had seen the bite several *years* before the actual outbreak. That case was a well-marked one, but the interval was so long that it is hard to believe the hydrophobia to have been connected with a wound inflicted at a time so very distant.

George R., aged 13, admitted into Guy's Hospital under Dr Rees, January 16, 1865. Has always been a healthy boy; father and mother, and numerous brothers and sisters alive and well.

On December 18, twenty-nine days ago, as he was returning home from school, he was bitten in the upper lip by a large dog. This dog was then under treatment for madness, but had got loose in some way. The dog subsequently bit a little girl slightly in the hand, and was immediately afterwards killed by a butcher with an axe. The boy went to a surgeon's at Greenwich directly he had been bitten, and within a quarter of an hour the edges of the wound were pared and adapted by pins and strapping, as in the operation for hare-lip. The pins were removed in nine days, and very soon afterwards the wound was healed. The mother says that he had severe rigors just before the pins were removed; they came on twice a-day, and lasted about a quarter of an hour.

The boy was in his usual health after the wound healed, and, according to the mother, even sharper and quicker than previously.

On Thursday afternoon, January 12, however, he began to complain of headache and lassitude, and stiffness of the face, which commenced in the right side, (where the scar is,) and afterwards extended to the left. He slept well that night.

On the following day he still had more or less headache, and the stiffness of the face continued.

On Friday night he was restless.

On Saturday he was about the same, but began to lose his appetite, which up to that day had been very good. In the afternoon, however, he went out shopping with his mother. He was very restless that night.

On Sunday morning at breakfast he first felt a difficulty in swallowing liquids, and had a spasm when trying to drink his tea, and stiffness of the neck came on. He swallowed a teaspoonful of gruel on Sunday with difficulty, but has taken nothing to eat or drink since.

On Sunday night he was very restless, and did not sleep at all. At two o'clock in the morning he asked for a draught of cold water, but could not swallow, as the attempt brought on a spasm. He was again offered drink, but could not take any, although thirsty.

State on admission at twelve o'clock on Monday morning.—He has an anxious, frightened expression of countenance. The intellect is quite clear, and he answers questions intelligibly, although unwillingly, because talking seems to bring on spasm of the cervical muscles. He had a convulsive attack when first placed in bed, owing to the draught caused by throwing a blanket over him. The scar on the right side of the upper lip is like that after the operation for hare-lip, with the marks of the pins on either side. He says that there has been no pain, itching, nor numbness in the part, and there is no evident inflammation nor swelling. He complains of pain in the neck and face, but there is no spasm when in bed. The breathing is very peculiar, accompanied by sighing; respirations 14 to 16, laboured. Pulse 92 to 98, irregular.

When a glass of wine was brought he declared that he could not take any, but when pressed he raised the cup to his lips with a determined air, and succeeded in swallowing a little with much difficulty; but immediately spasm of the cervical and thoracic muscles came on with a general convulsive fit. He then fell back into the bed exhausted and panting for breath. When asked some time after to take more he refused, and seemed almost to have a spasmodic attack at the thought of it.

2 P.M.—Continues in the same condition. Has had no more spasms. On trying again to drink some wine, he succeeded in swallowing about half a teaspoonful, but with much distress, and a spasm came on immediately afterwards. Respiration variable—14 to 18. Pulse very irregular, varying from 88 to 102 in a few moments. Dr Rees ordered him to be kept as quiet as possible, aud curtains to be placed round the bed, to keep off draughts.

℞. Quinæ Disulph. gr. vj.; acid. sulph. dil. M. x.; vin. rubri. aquæ āā ℥j. fiat.; enema 2 dis horis. As much port wine as possible; but only to be given at intervals of three hours.

4 P.M.—Pulse 98, irregular. Respiration 16, sighing and irregular. Complains of stiffness of the right arm. Injection 4.30 retained. Refused to take wine.

5 P.M.—The pulse 104, irregular. Respiration as before. He complains of pain in both arms, coming on with the paroxysms, which are slight, the respiratory muscles being chiefly affected. They begin with a slight cough, followed by rigidity of the cervical muscles, and quick, sighing respirations.

6 P.M.—A spoonful of wine was administered, followed by the usual convulsions, and also by paroxysms of pain in the legs as well as in the arms. The pain went off in a few seconds.

7 P.M.—Pulse 104; respiration 14. Has had two or three slight spasms during the hour. Complained of the light, and asked to have the gas turned down. He then for the first time wanted to spit, and with difficulty spat up a little thin mucus. Injection given and retained.

8 P.M.—Has been starting up in bed with a sensation of choking; complains of aching pain in the epigastrium. He asked for cold water. Some wine was brought in a mug; he held it for a moment, and then asked for a spoon; this he thrust into his mouth with a determined effort, but immediately spat out the wine, saying that he could not swallow. This was followed by a spasm. Complained of the light of the fire, and curtains were put up. The spasms are frequent, more severe, and excited by any noise. The injection was repeated, but he passed it directly afterwards with some urine, the first since admission. Pulse 100, weaker; respiration 22.

10 P.M.—The spasms having become more frequent and severe, attempts were made to administer chloroform, but these caused violent spasms and a burning sensation, as of mustard, in the throat. He threw himself out of bed during one severe spasm. Another injection given, c. tr. opii. mxxx.

11 P.M.—Has had several spasms during the last hour, shrieking out apparently in great pain, and trembling all over. Is becoming strange in his manner.

Tuesday, 12.15 A.M.—Has been somewhat quieter. Asked for bread and butter, and swallowed a little without any spasm. He then asked for drink, but the sight of fluid caused a spasm, which was increased when he tried to drink. He said that his "throat was stuffed up." Asked the gentleman attending "to breathe away from him."

1 A.M.—After a good deal of trouble we administered another injection (with opium.) Before this he had continuous attacks of spasm, passing rapidly from one to another for eighteen minutes; after which he seemed quite exhausted, and panted for breath. He wanders in his mind.

2 A.M.—Quieter; has only had two or three spasms since the last injection.

3 A.M.—For the past forty-five minutes, has been in a state of constantly recurring spasms. At the onset of a severe spasm he springs up in bed; then puts his hands furiously to his throat, as if to tear something away; the head is thrown violently back, the mouth open, and the eyeballs protruded; then he makes several expiratory efforts, sometimes with a shrill, screaming cry, the head is thrown violently from side to side, and the hands tossed wildly about, beating his chest, and striking anything that is near; the spasm generally ending by the expectoration of a viscid mucus, which recently has been tinged with blood. The passage of the enema tube caused a spasm, but the injection was retained. Pulse 114; respirations very irregular, and so interrupted by the spasms that they cannot be counted.

3.35 A.M.—Spasms continue, but perhaps somewhat less frequently. He has much trouble with viscid mucus, putting up his hands to tear it away from his mouth during the spasms. He asked for drink, and when wine was given him he took two or three spoonfuls hastily, just managing to swallow them before a spasm came on. He then asked for bread and butter, and ate some, though several times he was interrupted by spasms; before finishing it, however, a severe spasm came on, and he vomited the whole into his hands, and threw the vomit to the other side of the room. Respirations taken between the spasms 32 per minute.

4.15 A.M.—Is in a state of almost constant agitation, throwing himself about in the most frantic manner. Skin so irritable that the least touch throws him into a spasm. Says he is hungry, but that trying to eat brings on a violent spasm. He keeps jumping out of bed and crawling about the floor and under the bed. Mind wandering very much.

5 A.M.—Spasms continue very severe. He rolls about the bed, throwing his arms and legs about most violently. Vomits and spits a large quantity of a thin matter mixed plentifully with blood. Is wildly delirious.

6 A.M.—Has become so excessively violent that he is kept in bed with the utmost difficulty. Fights and struggles most violently, screaming, shouting, and spitting in all directions.

7 A.M.—The violence of the struggling is abating, and the delirium now assumes a playful character; he tosses his arms about in a choreic manner; keeps coughing and hawking up a viscid bloody mucus. An enema had been administered at 6.30, which before was quite impossible. Respirations laborious, and accompanied by a peculiar cry; pulse very irregular, and so weak as hardly to be felt, 150 to 180.

7.45 A.M.—Quieter, but still rolls about in the bed, and tosses his limbs. Intellect somewhat clearer, but still wandering. Answers questions intelligibly. When asked

if he was thirsty, he said that he should like something to drink, and on wine being offered, he swallowed a mouthful pretty well with coughing and some spasm, and then asked for more, drinking altogether from two to three ounces, with very little general spasm only of the pharyngeal muscles. The mouth is filled with an adhesive frothy mucus, which he cannot spit up. Respiration less laboured; pulse somewhat stronger—114 to 120.

8.15.—Seems exhausted; going into a state of low muttering delirium, with twitching of the limbs. An enema was administered before 8 without any apparent effect.

8.25.—Is becoming insensible; pulse imperceptible; extremities cold. Died at 8.30 very quietly, apparently from syncope.

A *post-mortem* examination was made by Dr Wilks, but nothing was seen, with the exception of redness of the back of the tongue and fauces, and some injection of the larynx and upper part of the trachea. Nothing was seen on a superficial view of the brain and cord, but the pons, medulla oblongata, and spinal cord are in the hands of Mr Durham for careful microscopical examination. As these parts will require to be hardened by chromic acid before sections can be made, some time must elapse before we can give the results of Mr Durham's researches.

RECUEIL DE MÉDECINE VÉTÉRINAIRE.—LITHOTRITY IN THE HORSE.

By Professor Bouley, *Alfort.*

The subject of this, a bay five-year-old gelding of a light breed, was brought to the college (Alfort) by the owner, who had recently purchased him, under the impression that he was the subject of a redhibitory vice. The symptoms noticed by him were frequent attempts to stale, with the passage of urine in very small quantities only, and an unintermittent dropping of urine from the urethra. The horse appeared otherwise in perfect health, with supple skin, smooth, shining coat, and excellent appetite and spirits. The penis hung slightly from the sheath, and urine of a muddy character dropped from it incessantly. His frequent attempts to stale produced only a small stream of urine, which on standing threw down a yellowish white sedimentary deposit.

The fossa navicularis contained some grayish-white sebaceous matter, of a pasty consistence, but too little to interfere materially with the discharge of urine. The mucous membrane of the sheath was inflamed, and apparently ulcerated, and bled on being touched. Examination through the rectum detected the presence of a round body on the floor of the pelvis, of the size of the closed fist. On pressing with the fingers on its anterior part, it can be detached from the fundus of the bladder, in which it was evidently enclosed, and advanced towards its neck. It was undoubtedly a urinary calculus.

Considering the ill-success of lithontriptics, it was decided to operate with the *lithotriteur*, which was accordingly done on the 21st February, after the patient had been prepared by two days of light diet.

The horse being left in the standing position, the urethra was distended by the injection of tepid water, and an incision made into it about eight lines beneath the anus. A grooved director was introduced, and with the bistoury a slight incision made upward in the course of the median raphe, until the wound was dilatable to the extent of nearly two inches.

The animal was next cast and properly secured, being maintained on its back by bundles of straw on each side of the chest and abdomen. The *lithotriteur* of Dr Guillon was now introduced through the urethra, but for twenty minutes all efforts to seize the calculus were ineffectual. The obstacle being ascertained to be the contraction of the vesical walls firmly over all parts of the stone, the bladder was distended by the injection of tepid water, and the calculus was then readily grasped by the blades of the instrument. The first attempt, however, only crushed a fragment of the stone, yet a number of small pieces, of a grayish-brown colour, were expelled immediately afterward. These were hard and could not be crushed between the fingers, but readily broke up under the pressure of the nail.

Several other successful attempts were made after the distension of the bladder, and at last the entire calculus was reduced to a kind of mortar, consisting of pieces of different sizes. One piece larger than the rest, extracted by the lithotomy forceps, and weighing about ten drachms, (thirty-five to forty grammes,) was convex on the

one side and irregularly broken on the opposite. The broken surface showed a series of layers of various degrees of thickness, superposed on a central nucleus. It was concluded that the stone had been thoroughly broken down and expelled, when the hand introduced into the rectum no longer felt any hard movable body in the bladder, and when that organ had contracted on itself into the smallest possible bulk, without any of the doughy sensation imparted by the presence of sabuloos deposit.

The animal was raised, and the wound in the urethra plugged with tow to check the hæmorrhage, which had been considerable during the forty-five minutes the operation had lasted. He was now rubbed dry, comfortably clothed, and conducted to a warm stable. The pulse had become strong and quick, the conjunctiva injected, and the breathing accelerated. Vesical colic soon appeared, but of a mild type, the patient lying down cautiously and extending himself on his right or left side, without struggling about as in violent pain.

Treatment.—Walk two hours and give laxative injections, (Sodæ Sulph.) Give laxative draughts (150 grammes) of the same salt, to exercise a derivative effect toward the intestinal mucous membrane. Give camphorated electuary (fifteen grammes camphor) to allay the spasms of the bladder. Apply sinapisms to the four limbs, and a very warm poultice over the loins. Inject decoction of poppy heads into the bladder to calm the irritability of the mucous membrane.

Colicky pains continued during the day and part of the night.

At night was an exacerbation of the febrile symptoms, with prostration, rapid, quick pulse, accelerated breathing, profuse sweating, and muscular weakness.

Next day, the 22d, the horse seemed better; the weakness and depression less; the skin hot and dry; the pulse rapid, (68 per minute,) and very weak, and respiration calm. He sought to eat. The urine escaped by the wound and ran down the thighs, though at times a jet was expelled by a sudden contraction of the bladder. There was serous infiltration round the wound. The animal has purged actively. Give laxative drinks and injections, and clothe warmly. Mashes allowed.

On the 23d the improvement continued. Skin warm, pulse slower and stronger, and respiration quiet. Appetite good. Poplar ointment was applied to the thighs to prevent irritation by the urine. Laxative clysters were continued, but the draughts replaced by diuretic doses of nitre, (twenty-five grammes.) Half the ordinary diet allowed.

On the following day there was marked improvement in the spirits and general condition. The wound discharged with the urine a little yellowish serous pus. A small quantity of urine passed through the penis. The same treatment was continued. On the 25th the pulse and respiration had returned to the normal standard, and laudable pus escaped from the wound. On the 26th the poplar ointment was replaced by a layer of tar, as extensive depilation and separation of the epidermis was taking place.

By the 4th March the wound was so far closed that a few drops only escaped by it during the most violent contractions, and by the 12th it had completely closed.

The gelding was discharged on the 17th, and at this time the wound showed only a slight cicatrix. The urine continued to be expelled at frequent intervals, the bladder having evidently undergone a considerable diminution in size, and become incapable of holding any quantity without being stimulated to expel it. In urination too, the last portions were expelled in a series of jets, coincidently with the violent action of the expiratory muscles and accelerator urinæ. It would appear that the muscular coat no longer enjoyed its natural contractility, that the viscus could not contract fully on itself, and that it could only be completely emptied by the action of the expiratory muscles.

VERTIGINOUS SYMPTOMS IN THE HORSE DUE TO A CHOLESTEATOMA.

By M. Vernant, junior, *Veterinarian at Clamecy.*

The subject of this affection, a horse in very good condition, was bought at a fair, and two days later did a good day's work in harness to the entire satisfaction of the driver; but the same evening at eleven o'clock, was attacked with the symptoms in question. When first seen by M. Vernant, he rested motionless, and insensible to all around him, his head in the manger, and pressed against the rack. The eye was dull, and the

expression haggard and depressed, the movements were stiff and difficult, that of backing particularly, and the animal invariably returned to his manger where he could find a support for his head. The appetite was gone, there was marked trismus, the mouth was hot and dry, the belly tucked up and no passage of fæces. The breathing was deep and slow, the artery full, tense, and hard, and the mucous membranes red.

During the examination a paroxysm came on, during which the eyes in place of being dull became fixed and prominent, and the movements precipitate and reckless. He reared up and pushed with all his force against the rack, first at one side and then on the other, but always in a forward direction. After pushing in this way for some time, he reared anew and executed various irregular movements, but in the course of a quarter of an hour relapsed into the same condition as before the paroxysm.

He was treated by bleeding, counter-irritants, cold to the head, and other measures, but with little benefit. He sought to eat, but could take little on account of the trismus. He had three paroxysmal attacks during the next six days, at the end of which he died. Death was preceded by great prostration, the pulse gradually became weaker, the breathing more laboured, and the head and limbs engorged.

The *autopsy*, made five hours after death, showed nothing remarkable until the left ventricle of the brain was opened, when there escaped an abnormally large quantity of a yellow serous fluid. The entire cavity was filled by a flattened elliptical tumour, an hypertrophy of the choroid plexus, weighing 9 drachms, and measuring in its longest diameter, 2 inches and 4 lines, and in its shortest, 1 inch 3 lines. The surface was in a series of irregular rounded masses, and the whole covered by a smooth membrane—apparently the pia mater. The mass was firm and resistant at the extremities, and less so at the median part. The colour is yellowish, with a number of small glistening bodies of a golden hue. The envelope was intimately adherent to all parts of the tumour. The tumour was easily cut, and from the incision escaped a yellow, odourless fluid, having a saline taste, and holding in suspension a number of the glistening yellow bodies above referred to. The tumour was otherwise composed of a series of lamellæ superimposed on each other, and permeated by numerous small vessels. The structures on the floor of the ventricle, particularly the corpus striatum and the hippocampus major, were greatly atrophied.

ROYAL COLLEGE OF VETERINARY SURGEONS.

THE TWENTY-SECOND GENERAL MEETING of the ROYAL COLLEGE of VETERINARY SURGEONS will be held, in accordance with the provisions of the Charter, at the COLLEGE, No. 10 RED LION SQUARE, LONDON, on MONDAY, the 1st of MAY, at One o'clock precisely, to receive the Annual Report of the Council, and also the Treasurer's Report; and to elect Seven Members of the Council, Six in the place of the following, who go out by rotation, viz.,—William Burley, William Ernes, William Mavor, John Legrew, Samuel Hicks Withers, and Thomas Dike Broad; and one in the place of John Ellis, deceased.

ROBERT LEWIS HUNT, ESQ., the President, in the Chair.

W. H. COATES, *Secretary.*

10 RED LION SQUARE, *March* 1865.

The ANNIVERSARY DINNER will take place as usual, on the evening of the same day, at Six o'clock.

BALLANTYNE AND CO., PRINTERS, EDINBURGH.

THE VETERINARY REVIEW

AND

Stockowners' Journal.

ORIGINAL COMMUNICATIONS AND CASES.

Pleuro-Pneumonia, and Epizootic Aphtha; information relative thereto furnished to Mr G. ARMATAGE, Hon. Sec. to the North of England Veterinary Medical Association; V.S. to the Right Hon. the Earl Vane.

(*To the Editor of the Veterinary Review.*)

February 20, 1865.

THE following communication and accompanying questions have been forwarded by me to upwards of forty practitioners, including the whole of the members of our Association, with the view of obtaining information respecting the nature and prevalence of "pleuro-pneumonia" and "epizootic aphtha" in various districts. I regret, however, in being compelled to content myself with so meagre a report from sources which *should* prove the most abundant. Out of the above number of communications forwarded, *four* replies only have been received, two of which, as will be seen, are from practitioners far distant from the centre of our operations. It cannot be that the diseases in question have *not* prevailed in many of the districts around, and thus have created an impossibility to supply the desired information—we know it is the contrary; and if our brethren in active cattle practice would kindly forward information on such points, it would materially assist in a general work of good. We cannot expect to advance under such apathy; like the faint-hearted waggoner, our entreaties for help without will never be heard or answered until the materials for an earnest movement are demonstrated to have an existence within.—Yours truly, GEORGE ARMATAGE, *Hon. Sec.*

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION,
October 1, 1864.

DEAR SIR,—Information upon the following diseases is earnestly requested. Will you kindly furnish the same as far as your ability will admit, observing the numerical order in the arrangement of your answers to facilitate reference, and oblige, dear sir, yours very faithfully, GEORGE ARMATAGE, *Hon. Sec.*

PLEURO-PNEUMONIA.

1. Has this disease prevailed in your locality of late? and what have been the general characters?
2. Is it, in your opinion, on the increase, stationary, or otherwise?
3. What losses, direct or indirect, have come under your notice?
4. What has been the ordinary duration of the disease? And how have animals or carcases affected been disposed of?
5. As a rule, are animals affected placed under medical treatment? or, is it likely that many become affected, die, and are disposed of without?
6. Have any instances of direct contagion come under your notice? If so, how was it effected?
7. What class of owners in your district suffer the greatest losses? and to what do you attribute the cause?
8. What kind of treatment, remedial or preventive, have you adopted? and with what results?

MURRAIN, OR VESICULAR EPIZOOTIC.

The same questions will apply in this disease also, with, however, this addition.

9. Have you known the disease to be communicated to the human subject, by the use of the milk of affected animals, or other means? and are such instances rare, or of common occurrence.

REPLIES.

Mr ———, *Roxburghshire.*

October 27, 1864.

PLEURO-PNEUMONIA.

1. There has been little of the disease in this district for some time, until within the past two months, about the beginning of which period there was a large importation of Dutch cattle. The cases occurring among the imported cattle have been virulent.
2. Since the period I have indicated, it has been on the increase.
3. Losses to the amount of several hundreds of pounds.
4. About fourteen days from the first observable symptoms of illness, until the animals were either destroyed, or died. The carcases have generally been buried.
5. They are not, as a rule, placed under medical treatment. Many I doubt not, become affected, and disposed of without treatment.
6. *Nearly all are cases of direct contagion,* traceable to contact with the imported Dutch cattle; almost every lot of which is diseased,—*i.e.* if not actually in some of the animals showing unmistakable symptoms of pleuro-pneumonia, it is in a few weeks fully developed.

7. Those who are most frequently in the market; traceable to the purchasing of animals, to which they are liable from their extensive dealings.
8. To detail my treatment in cases of pleuro-pneumonia, I fear would weary you. I may, however, briefly express it as expectorant in its nature. I endeavour as much as possible to treat symptoms as they arise; and by all means support the animals' strength. Recoveries amongst cases treated, I may state at about 25 per cent.

As a preventive, I have more confidence in segregation, with attention to the general comforts of the animal, than aught else. I have tried various internal medicaments as preventives, but have little faith in them.

MURRAIN.

1. It has been in the district lately. Nothing particular observed in the symptoms, which have been of the usual character.
2. Rather on the decline.
3. The losses have been slight, only in deterioration of the stock affected.
4.
5. Only in bad cases, or when animals affected are numerous, is medical advice sought.
6. The majority are cases of direct contagion, either by contact of healthy with diseased, or by the placing of sound animals on ground, or in trucks previously occupied by those diseased.
7. The answer under pleuro-pneumonia applies to this also.
8. In treating cases of vesicular epizootic, I simply direct them to have a clean and dry lair, and furnish an astringent wash for feet and mouth.
9. I have never known of the disease being communicated to man; but am acquainted with cases where disorder of the digestive organs have followed the use of milk from animals suffering from murrain.

There is nothing I am more completely convinced of than the contagious nature of pleuro-pneumonia. I could furnish hundreds of cases from my notes and memory to prove the truth of the assertion.

The Dutch black and white cattle are, and have been at every great importation, the scourge of the country. They have within the last two months completely infected the border counties; depend upon it, something must be done, sooner or later, to check this state of affairs.

Mr ——, *Newcastle.*

October 4, 1864.

DEAR SIR,—In furnishing you with answers to questions relative to the diseases of cattle—pleuro-pneumonia and vesicular aphtha,

I may premise that my practice among cattle is not very extensive, being chiefly confined to cow-keepers in the town and neighbourhood; but what information I can give you is at your disposal.

As far as the latter disease is concerned, I have had but few cases, and those of a mild character.

PLEURO-PNEUMONIA.

1. It has prevailed much of late, and often fatal; many cases being in an advanced stage before receiving medical aid.
2. Continues quite as prevalent.
3. I have not had any instance brought under direct notice when the losses have been very great; but have heard of one proprietor who lost a great number of animals within the last month or two.
4. Ordinary duration, from five to ten days, sometimes as long as three weeks; and generally sent to the knackers' sometimes before, sometimes after, death.
5. Many animals are undoubtedly affected, and never placed under treatment; but die, or are otherwise disposed of.
6. I cannot say that I have traced any case to direct contagion, although they may have been placed in circumstances favourable to it.
7. Cow-keepers. Sometimes to contagion, sometimes to atmospheric influence; often aided by a want of proper attention to diet, exercise, and ventilation.
8. As remedial measures, I recommend change of situation, but this is not often practicable—aperient, stimulant, &c., &c., with a liberal diet, and counter-irritation external to the parts affected. In the early stages, I have found treatment invariably successful.

Mr W. B. T., South Yorkshire.

October 4, 1864.

PLEURO-PNEUMONIA.

1. The disease prevailed in this neighbourhood in the months of April and May. I have had only a few cases since; the disease mostly prevailing from April and May to June,—few instances occurring during the remaining nine months of the year. About twenty-four cases occurred in the above months; seven only were treated; the others being in moderate condition, were sent alive to the slaughter-houses, and killed for human food.
2. I am quite convinced, in my practice, however, that the number of cases gradually and regularly decreases every year.
3. Four animals have died under treatment; two old cows, and two heifers.

4. In the fatal cases, the animals lived about a fortnight, and the carcases, except the skins, were buried deep; the places in which they were kept were well fumigated with sulphurous acid and chlorine gases.
5. As the prognosis is so different in these cases if they are in moderate condition I generally order them to be sent off at once to the butcher; and in order to stay the spread of the infection, my advice is generally taken.

   It is seldom we treat them unless they are in low condition, when young animals often recover—old ones but seldom; on the average, two-thirds of those treated recover.
6. I have never known a case arise from direct contagion; *but have known scores of cases of infection*, where healthy animals have been placed, and only for a short time, into places contaminated with the expired air from the lungs of diseased cattle.
7. Cattle-dealers and farmers who are often changing their stock and bringing foreign cattle into their yards. *Of these I find the Irish cattle most dangerous.*
8. Treatment—aperient alteratives in the first instance—setons in dewlap—Ol. Mylabris. et Tereb. Tinct. Crotonis, as a vesicant to parts externally; succeeded by the various stimulants, and followed by tonics, mineral and vegetable, with the Pot. Iodid.

ECZEMA EPIZOOTICA.

1. This disease prevails in this district every year, raging for a few months, and then almost disappearing. I think it is generally during the first three months of the year that its worst forms are witnessed. This year, however, it has not been so fatal in milk cows, nor have I known a fatal case from implication of the mammary gland.
2. Now stationary.
3. No direct losses this year.
4. From a week to ten days.
5. They, as a rule, are not placed under medical treatment, except milk cows, when the mammary gland is affected.
6. Scores of cases.
7. Cattle-dealers, and farmers who are often changing their stock. I attribute the causes to contagion and travelling.
8. *We never use any preventive means*, and scarcely ever treat them.
9. I have known the milk from diseased cows used frequently, but never heard of any complaint, or ill effects from so doing.

Mr ——, *near Newcastle-on-Tyne.*

October 9, 1864.

PLEURO-PNEUMONIA.

1. It has prevailed to some extent, and of a milder character than formerly.
2. On the decrease.
3. Out of from 60 to 70 cases which I have had under my own treatment, more than half recovered. Some of these were very mild cases; seven very severe cases out of that number recovered. Indirectly I know of many cases which have not been treated, those dying and got rid of as quickly as possible; the owners of such being anxious to hide from their neighbours that they have had the disease.
4. Individual cases, from three to six weeks; where several had been affected, from five to six months. In one instance, it extended over nine months, no fresh animals being brought on the place. *N.B.*—This is from the first visible appearance of the disease.

   No sale of diseased carcases have come under my notice this year.
5. I believe that in this locality, the greater part of animals affected are not treated.

   Many are sold in public markets as soon as the disease shows itself.
6. There is not one single instance of the disease occurring in my own practice that I have traced to direct contagion.
7. Small farmers and cowfeeders who are buying fresh stock frequently.
8. Remedial.—Counter irritation, stimulants, tonics, and careful nursing; the latter of the greatest importance. Preventive.—Tonics, removal of diseased animals. Use disinfectants indoors, and enjoin cleanliness, &c., &c.

MURRAIN, OR VESICULAR EPIZOOTIC.

Not a case of this disease has come under my notice for the past two years.

There is little I can add to the above. Pleuro-pneumonia among our cattle I have not seen for the past two years. The animals under my charge being purchased in November, and housed for feeding, are sold off in May following, selected generally from the stock of the breeder—a course which has hitherto rendered them exempt from the scourge.

Vesicular aphtha, however, caused much trouble during the spring of the past year. One animal died out of about fifty more or less affected; and in one instance which came under my notice, fifteen animals which had remained a considerable time free from the affec-

tion, although kept tied up in a byre, showed symptoms of the disease in a very short space of time after some cattle from Newcastle market, labouring under the affection, were placed in an adjoining field.

Mineral tonics administered to cattle not already showing the symptoms of disease were singularly preserved during its effects subsequently.

It has come to my knowledge that several farmers, not far distant, during the past year lost their cattle by pleuro-pneumonia, and in other instances sold them in market to avoid loss themselves, and to the detriment of others. *One careful old gentleman takes advantage of the night, and packs off the carcasses to London.* Of the origin of these diseases I hear but one opinion,—farmers and butchers agreeing that the foreign cattle import the disease, while the traffic in our markets perpetuate them; and as far as legislation goes are liberal enough to admit, that measures for preventing the sale of diseased living animals by dealers should be adopted, or powers given whereby a person could sue the salesman for damages; but they dare not vote for such, because it acts as a two-edged sword, and cuts each way. In fact, what is wanted by them, is a measure to protect farmers, and legalise the sales of *their* unsound meat; while the dealers from whom they purchase the living animals shall be liable to a heavy penalty. From what I have seen, disease of a contagious character arises quite as much from the practice of farmers and dairymen disposing of infected stock in neighbouring markets, when most probably a man equally as necessitous purchases under the idea that he had better do that from a farmer whom he knows, or has heard of, than take them from the stock of a dealer; when he finds himself no better off, and in most instances considerably worse.

If a case occurs among cattle on a farm, in a majority of instances the whole are driven to market and sold; other stock is thus rendered unsound by the spread of disease, and the farmer becomes equally as culpable for the mischief which is created in his own hands, as in the case of loss to others by his countenancing and fostering a proceeding unwarrantable as it is infamous.

Next to placing a strict watch upon imported cattle, should come, in my opinion, the exercise of principles of judicious management on our farms and in town dairies. When cattle are affected with contagious diseases, the removal of which is well known to imperil the health of the stock of another individual, it is high time the latter should not only be protected against such by the laws of his country —in his case the rights and liberty of the subject being respected— but no one should be allowed to elaborate and carry on a nursery for malignant fevers and virulent epizootics to the detriment of the former, because, in his opinion of the rights and privileges of a subject, he can do so with impunity upon his own premises.

The same principles which attempt a provision against fraud on the one hand, would also diminish the pressure of evils giving rise to it on the other.

It would therefore prove more profitable to the owner to prevent disease by measures specially studied and provided, than to suffer as at present from the insecure state of things, and propagate the same through the extent of the surrounding localities to the detriment, of he knows not how many, of his friends and neighbours.

Agricultural education will not be complete, until the farmer is conversant with the elements of those principles which in their observance regulate the safety of his stock, increase his personal profits, and no longer endanger those of others.

On Certificates of Soundness. By M. F. M. CASE, New Veterinary College, Edinburgh. Being an Essay read before the Veterinary Association, in the New Veterinary College, on the 10th of March 1865.

THE subject which I have chosen for this evening's consideration is not one calculated to lead to much scientific discussion, but it may, probably, prove as interesting as the usual texts for our evenings' debates.

The opinion is very generally entertained amongst veterinary surgeons, that many practitioners injure themselves permanently amongst educated men from the clumsy, ill-considered, and, indeed, ignorant manner in which they write certificates after they have examined horses for which their opinion has been sought. I am inclined to attribute this to the very slight importance attached, as a general rule, to a thorough understanding of the various points which should always be embraced in such documents. There are undoubtedly other causes which tend to render certificates of soundness unsatisfactory in the eyes of shrewd, though non-professional men. Amongst these I may mention, perhaps, the vagueness of the terms soundness and unsoundness, the extraordinary and ill-defined nature of many veterinary terms, such as spavin, curby hocks, thick wind, &c.; lastly, the great difficulty attending the satisfactory description of animals examined with a view to their undoubted identification. A horse buyer can easily be led by a knave to believe that the gray horse that he is wanting to buy has been examined, and in proof of which a gray horse's certificate is tendered.

Abroad the veterinary surgeon's duty is somewhat simplified, from the distinct manner in which the diseases are specified by law, for which horses may be returned. In some countries there are only three hidden maladies for which horses can be returned to the vendor. In some parts of Italy the defects are staggers, broken wind, and hæmaturia. In France the list is a little extended, as it includes—

1. Periodic Ophthalmia.
2. Staggers, or Megrims, termed in France, Epilepsy.

3. Glanders.
4. Farcy.
5. Chronic disease of the Chest.
6. Immobility; sleepy staggers of English authors.
7. Broken wind.
8. Chronic roaring.
9. Crib-biting without wearing of teeth.
10. Intermittent inguinal hernia.
11. Do. lameness due to old standing disease.

From the nature of this list you will readily understand why, whilst I was at Alfort, very few examinations of soundness could be seen, and these were not of the same rigorous character that we are compelled to institute in this country. Notwithstanding this the continental certificates are far more precise than our own. They are complicated legal documents in which many particulars are stated concerning the veterinary surgeon who examines, the order he has received for such examination, the time and circumstances under which the animal was examined, the breed, age, size, colour, blemishes, and proprietorship of such animal, the description of the disease discovered, and lastly, the conclusions arrived at, with the veterinarian's signature. No erasures are permitted unless initialed. It is no doubt fortunate for us that we are not bound down in the preparation of our certificates by rules so complicated and exact. Nevertheless we have greater difficulties to encounter in having to determine whether an animal is absolutely perfect or sound, or in the slightest degree imperfect, diseased, or unsound. Our greatest difficulty, undoubtedly, lies in the proper interpretation of the words soundness and unsoundness. The first means health and the second implies disease, and we are compelled thus strictly to interpret them in our daily practice. The opinion is very generally entertained that no horse can be unconditionally declared sound, and advantage is taken by unscrupulous men of the readiness with which slight imperfections may be discovered by professional men, though such imperfections in no way interfere with an animal's usefulness. When a horse has been purchased at too high a price it is well known that purchasers, in stable slang, try "to pick a hole in him." Unfortunately such practice has very much discouraged the breeding of high-class horses. Farmers know that if they invest their money in cattle and sheep they do not risk their money in law-suits; but a 300 guinea colt may impoverish the countryman and enrich the lawyer to the extent of twice or thrice the same amount. It is my opinion that to encourage litigation concerning the soundness or unsoundness of a horse is very reprehensible, and we should strive by all means in our power not to lead to misunderstandings; and it is for this reason that I think we should carefully study the forms of our certificates of soundness, that they may not be the means of leading men on thin ice.

The forms of certificates of soundness in this country vary much.

The simplest is probably the one, a copy of which I have obtained from Mr Cartledge of Sheffield. When filled up it reads as follows:—

"SHEFFIELD, 10*th March* 1865.

"By this I certify that I have this day examined, at the request of Joseph Brown, Esq., a bay gelding five years old, which I am of opinion is sound. (Signed) "B. CARTLEDGE,
Graduate of the Royal College of Veterinary Surgeons, and
Honorary Fellow of the Veterinary Medical Association."

In the event of the horse examined being unsound, Mr Cartledge states this simply, or adds his reasons why he considers the horse unsound. I have been informed that the London practitioners adopt a somewhat more complicated form. They usually add what is termed a note of identification, inasmuch as they are called upon to examine the same horse on several occasions, and disputes are constantly arising from the readiness with which a number of independent opinions are obtained. As an illustration of a London certificate I may adduce the following:—

"LONDON, 28*th November* 1864.

"I hereby certify that I have this day examined a gray mare, seven years old, the property of James Willoughby, Esq., and find that the said mare is affected with ring-bone on the near hind leg, and that she is consequently unsound. I am also of opinion that the said ring-bone existed and constituted unsoundness on the 1st instant, on which day it is stated she was purchased.

(Signed) "JOHN JONES, M.R.C.V.S."

Note.—"With a view to identification I have to remark that the said mare is wall-eyed, has a blemish of old standing on the off hock, and a melanotic tumour on the tail."

Some may think that the melanotic tumour should be mentioned with the ring-bone as a cause of unsoundness, but as it often constitutes nothing more than a blemish it may be mentioned as above.

Certificates are sometimes granted for other reasons than declaring horses sound or unsound, as in the case of an animal being examined as to age or fitness to work. We have to be guided somewhat as to the form by the wishes of our clients and the circumstances of peculiar cases. It must be understood that I am here alluding only to the *form* of certificate, as I do not wish you to suppose that I am in any way an advocate for distorting matters of fact. To explain what I mean I subjoin a third certificate:—

NEWCASTLE-ON-TYNE, 20*th March* 1864.

"I hereby certify that I examined on the 17th instant, at 11·30 A.M., at the request of Mr George Murray, horse-dealer, Newcastle, a bay gelding, seven years old, at the George Hotel, Kelso. I found the said gelding free from lameness, and capable of flexing both hock joints with perfect freedom. I am of opinion that the said gelding was fit for any work he could in reason be put to.

(Signed) "J. SMITH, Veterinary Surgeon."

Note.—"The bay gelding above-mentioned has a white streak on the face, and old standing blemishes produced from the hocks having been fired. I was, moreover, informed that the said gelding was sold by Mr George Murray to Captain Ramsay, on the 10th February 1864."

This may be considered as a fair sample of a certificate given under very special circumstances and required for a horse under dispute. It is needless to multiply examples, and were I to attempt to do so, I should exhaust your patience. I must now refer to the separate points which we are to hold in view in framing certificates. It would be superfluous for me to insist on the importance of correctly dating any such documents. The introduction which is usually "I hereby certify," may be slightly varied according to taste; but immediately following this it is necessary to be precise as to the period of the examination, which is commonly at the time of writing the certificate, or may be some former period. The description of the animal then follows, and many prefer entering somewhat into detail on this point in the body of the certificate. There are no doubt special advantages in a note of identification, but if this has to be dispensed with, it is usually necessary to say something at least as to the colour and age of the animal examined. There is no doubt whatever that blemishes should not be overlooked, as such oversight may be viewed in the light of negligence, and the existence of a peculiar scar is often of more value for the recognition of an animal than a description of its breed, coat, or proportions.

It is necessary that I should make a few remarks on the horse's mouth. Very often certificates are sought for no other purpose than that of ascertaining a horse's age. As the veterinary surgeon may not be informed of this, he should always be on his guard, and notice such irregularities as "Yorkshire fours," and "Bishops," "Parrot mouth," or teeth worn by crib-biting.

It is well known that when there are no serious irregularities in dentition, a veterinary surgeon can form a very correct opinion as to a horse's age up to eight and nine years. Some pretend to do much more than this, but in certificates of soundness all animals above eight should be marked as aged. We are of course often required to inform a purchaser, whether a horse declared aged is within a few years above eight or so far beyond it, that he may be considered very old. Whilst I do not think it is prudent for a veterinary surgeon to attempt to be too precise under these circumstances, it is obvious that for all practical purposes sufficient information may be obtained from the animal's general appearance, colour, angularity of bones, straight teeth with narrow triangular surfaces, and protruding tongue, in order to protect a purchaser from buying an old stager, which may be clean enough on his legs but worn out in his body.

An interesting anecdote on this point may not be out of place. A lady of high rank, well known at Melton Mowbray during the hunt-

ing season, wished to secure a handsome gray pony as a match for another to be driven in a phaeton. A medical man, whose horse-dealing propensities were well known, offered her ladyship a perfect gem, which he declared to be six years old. A veterinary surgeon pronounced the somewhat disguised animal to be above sixteen. The doctor thereupon declared he could produce a certificate of birth. But though such a document would have secured the sale of the pony at an exorbitant price, it could not be procured. I have purposely alluded to this case because there are instances in which a veterinary surgeon would have to bow to a well-authenticated certificate as to the date when an animal was foaled, as in the case of thorough-bred stock. Every competent practitioner, however, hits the mark so closely that he is not likely to be troubled with such certificates.

In certificates of soundness we are usually called upon to state at whose request an animal is examined, and mention is often made of the name of the proprietor. To all who intend practising in large cities, it is important to give a word of caution under this head. It is a common practice amongst horse dealers to have a horse frequently examined by a veterinary surgeon, and each time the ownership of the animal is declared different. I have heard of so many incautious practitioners having been led by this means to give absurdly conflicting opinions on the same animal, that I should advise no heed being taken of men or names until a thoroughly impartial opinion had been arrived at. It is perfectly possible that a horse pronounced sound one week should be unsound the next; but, on the other hand, it is impossible to reconcile some contradictory certificates, which prove that horses declared one day to have old standing spavins should ten days after be pronounced perfectly sound. If veterinarians lower themselves by passing or rejecting horses as it may suit their client's convenience, they of course disgrace their profession and must ruin their prospects for life. It is sometimes essential to hear what can be learnt of the history of a case, but it is best to do this after having carefully ascertained the condition of the animal at the time of the examination, and whoever consults, or owns the animal examined, must be treated in such a way as not to be led to believe that a veterinary referee is to be influenced by the likes and dislikes of those employing him. The temptation is often strong to make out a case for a friend; but no practitioner can gain the lasting esteem of any large circle of patrons, unless he is determined to act with the strictest impartiality towards all. He may and will occasionally offend a friend and great supporter, but he has in his professional capacity a great public duty to perform, from which he must not flinch for friend or foe.

The next element in a certificate is usually the decided statement whether a horse is or is not sound. There is no middle course to select. Explanations may be added, and a statement made that some slight defect which may exist in no way affects the animal's worth; but if a veterinary surgeon is required unconditionally to declare a

horse sound or unsound, he must tell the truth, the whole truth, and nothing but the truth, by which he may have to abide in the witness-box. I am aware that there are many who do not like to reject horses, if they do not find defects calculated to mar an animal's usefulness, but we must adhere to the definition of the words soundness and unsoundness, as accepted by law, and though this may occasionally lead us into a dilemma, as a rule it is found to answer well in practice.

Though a veterinary surgeon's opinion may very properly be asked as to peculiarity of conformation, it is not, as a rule, his duty to notice that a horse is cow-hocked, calf-kneed, or narrow-chested. It is presumed that a buyer knows what he wants, and if he be at all a decent judge, all he needs professional advice upon is the question of health and disease.

In stating under the head unsoundness what disease or defect has been noticed, it is essential to be as brief as possible. It is here that we find our veterinary nomenclature to be a great stumbling-block. The practice has become rather common of late to use the popular or commonly accepted name for a defect, and add a brief scientific definition. There are various ways in which this may be done, and this is perhaps best explained by a few explanations. Thus a veterinary surgeon says, "I find the said gelding to have chronic disease of the larynx, which renders him a roarer;" or, in another case, "I find the gray mare aforesaid to be affected with spavin of the near hock, that is to say, she has exostosis and ulceration, implicating the tarsal bones on their inner aspect." No doubt some of you will think the last-named definition rather pedantic for a certificate of soundness, but if a veterinarian includes in his certificate the name by which any disease is commonly known, he is at liberty to add whatever he likes in the way of affording an unmistakable and scientific explanation of his opinion. With a view to secure simplicity, some veterinary surgeons are apt to fall into the error of using very vague expressions, such as "I hereby certify that the above-named gelding is unsound, from a defect in his wind." Besides this being very inelegant, it bears no indication of the examiner having diagnosed the cause of unsoundness. Although a certificate were given by one of the highest London practitioners in terms such as the above, I cannot think that any of you would admire it.

It is commonly at the conclusion of a certificate that a definite opinion is recorded as to whether or not a disease is of any long standing. This is often the most onerous part of our duty, best honoured in the breach than in the observance. We should exercise the greatest caution, and not do as some who are prepared to stake their reputation on an assertion that a malady has existed months and months prior to a horse's examination. Not long since there lived in a flourishing town in the west of England an old practitioner in very fair repute, who would never hesitate to declare that a spavin or a ringbone must have existed for three or four years, and he would

even go so far as to swear that the animal must have been born with the disease upon him.

It must savour of superfluity to remind you that you have to append your signature, and if you wish, your titles, to any certificate you may grant. I may be permitted here to express a wish that all my fellow-students may in due course pass a successful examination, and being pronounced sound, secure the proper authority to style themselves Members of the Royal College of Veterinary Surgeons.

Before concluding, I must say a few words on the note of identification. The best note of identification is the one engraved on your memories. Watch your horses, that you may not speedily forget them. Some men have a greater aptitude for this than others, but all can more or less cultivate the power of recollection. The note appended to a certificate, however, affords a means of determining whether a horse said to have been examined by a number of veterinarians has really been seen by them all; and it is more with a view to detect or defeat a fraud than for personal satisfaction that such a note is made use of. Whatever marks are mentioned should be referred to in the fewest possible terms, and none need be introduced of a superfluous nature.

I am aware that in selecting the difficult subject of certificates of soundness on which to write an essay, I have been guilty of no little temerity. I nevertheless felt that even my scanty experiences on this important topic might be somewhat acceptable. I might have said much more on the great responsibility which devolves on us when called upon to act either as advisers to, or mediators between, the purchasers and sellers of horses. We may be guilty of serious injustice through inadvertence. We are all liable to err, but we should strive to avoid the possibility of an imputation that any one has been wronged at our hands through a blameable partiality or carelessness. Nothing remains for me but to hope that the crude observations I have penned may lead to some profitable discussion, of benefit to all.

On Laminitis in the Horse. By JAMES BROOKES, M.R.C.V.S., The Hope, Pilkington, near Manchester. Being an Essay read before the Lancashire Veterinary Medical Association on the 1st of March 1865.

MR PRESIDENT AND GENTLEMEN,—The subject which I have to bring before you this evening, viz., *Laminitis and its companion Symptomatic Fever*, is one of the most important that has ever offered itself to the serious contemplation of our profession.

It is a disease so dreadful in its manifestations, and attended with such agony, pain, and excessive distress to the poor patient, as cannot fail to excite compassion for him from all who witness a case of this

terrible type; and, gentlemen, I can assure you, that I myself have frequently been so affected, that I would not, nay, I could not leave my distressed patient until I was satisfied that the utmost had been done, so far as professional knowledge lay within my reach, to relieve it from some portion, at least, of his intense sufferings.

The first and most obvious requisite for a practitioner, therefore, is to possess the facility to diagnose a disease when he sees it—to distinguish it from others manifesting similar symptoms, and thus to foresee its probable phases and results. The treatment which he adopts will be judicious in proportion to the readiness with which he recognises, and the accuracy with which he discriminates diseases, and will be either rational or empirical, according as he understands or not their real nature and true cause. It is in the investigation of the nature and cause of laminitis that I earnestly desire you this evening to co-operate with me. No man, whatever may be his pursuits, deserves the name of a *practical* man, whose knowledge and resources are limited by the experience of his predecessors in a similar walk of life, or who cannot or dare not experiment or reason for himself. In all professions, and in none more so than in the practice of medicine, novel events, remarkable phases, and rare combinations, are continually presenting themselves which can only be understood and successfully encountered by the aid of general principles. Hence the need that every successful practitioner should have a knowledge of pathology and therapeutics, which supply the general principles to guide him in treating disease, or complications which he has not previously experienced.

Let us observe, for instance, the small strangulated hemorrhoid or pile in the human subject; look at the intense suffering, the most excruciating pain, the sympathetic and symptomatic disturbance in the system, nay, even the complete prostration, with which the most powerful man is overcome when suffering from acute inflammation, attendant upon an external pile, arising from the circumstances that the lower extremity of the rectum is so vascular, that the veins possess no valves, and that this region of the human body is periodically subject to mechanical disturbance. It is not a matter of surprise that hemorrhoids which are composed of structure in which blood-vessels are a main element, occur so frequently as they do. Here we clearly see that with increased vascularity we have greater tendency to inflammation and pain, when an abnormal or morbid condition of tissue is by any means produced. Well then, gentlemen, from the peculiar situation of the sensitive laminæ, and their being so highly vascular and abundant in nervous texture, the disease called laminitis, which has its seat in the reticular tissue that envelops the coffin bone, consists, I conceive, primarily in a congestion of blood which is soon followed by the most intense inflammation. The laminæ being situated, as I may say, in a blacksmith's vice, betwixt two hard substances, viz., the coffin bone and the hoof, high congestive inflammation is readily produced, and the most violent pain

and the most severe results is the consequence when inflammation ensues.

But, gentlemen, need I take up the whole of your time this evening, bringing before your notice a subject upon which so much has been written, by our late and eminently distinguished friend, Mr Percivall, in his "Hippopathology,"—a work which constitutes a library in itself. I desire to direct your attention, in order that you may perceive for yourselves, to his able and excellent remarks which have often afforded me profit and pleasure, and from which I have gathered fresh food as from a rich and always productive and valuable pasture; in fact, gentlemen, he has been my pioneer for a lengthened period. But lately, we have two other gentlemen, who have given us their ideas on this important subject,—viz., Mr Williams of Bradford and Mr Thomas Greaves of Manchester. I would commend to your notice the controversy which has been carried on between them within these last few months, and which will doubtless do much to convince you, and every other observer, that they are *men* well matured and well grounded in the science of disease.

Laminitis is of two specific kinds, which we may designate natural and unnatural.

1*st*. *Natural Laminitis* is mostly found in horses of a low breed, heavy and corpulent in body, such as draught horses of various kinds; and this arises, doubtless, from constitutional causes.

2*d*. Unnatural Laminitis, or artificial phase of this terrible disease, is most frequently met with in light bred animals, and, no doubt, is the result of their endeavour to resist the violence occasioned by over-exertion on hard roads, and by the exhaustion produced by rapid driving and other artificial deleterious causes, such as being suddenly called upon to perform long journeys, overloading or gorging the stomach with food, eating large quantities of wheat, or feeding upon new oats. There is one cause, however, so predominant and influential in its character, that ought never to be lost sight of, and that is *work*, or what may be construed into violence done to the feet. For instance, a horse with high stamping action going any great distance, or for any length of time upon a macadamised road, or hard pavement of any kind whatever, will be a very likely subject for an attack of this disease, particularly if it has been idle, at rest, or unseasoned, and is suddenly and at once put to do severe work.

Of the former character or type of this disease, I have had no less than eight cases, which have come under my care during the last three years, some of which animals have not been out of the stable or box for weeks, nay, for months, and the remainder have only followed their ordinary employment, yet all have been attacked with symptoms equally violent with the most virulent cases that have ever come under my experience. This is one among many evidences of the justice of my distinction of the *natural* from the unnatural or arti-

ficial phases of laminitis, and which cannot be accounted for by the general and popularly received theory that this disease is the offspring of violence or overwork. Surely, then, gentlemen, my theory is not ill founded, for there must be some occult or mysterious cause for this disease presenting itself under the peculiar circumstances which I have now related.

What, I have frequently asked myself, is this hidden or undiscovered cause?

Is it idiosyncrasy or some peculiar element in the system of the patient?

Is it cachexia or a bad habit of body?

And when ruminating upon this subject, I have frequently had brought to my recollection the remarks made by Professor Spooner upon this form of disease, during the period when I was attending his lectures, which were to the effect that "Laminitis," to all intents and purposes, belongs to the rheumatic class. And more lately, on perusing an excellent paper on this subject, the production in 1855 of our esteemed friend Mr Greaves, I find two right words used in their right place, in reference to the active cause of this disease—viz., the igneous element. I feel quite satisfied and fully convinced that this expression, "igneous element," is the very essence of this lamentable affliction to which the equine race is subject, lurking as it does in the system, waiting only for some exciting circumstance to rouse it into activity.

Just allow me, gentlemen, to call your attention to the rheumatic fever in the human subject. Here we have the symptoms somewhat similar to those which we see in the laminitic acute pain,—extreme tenderness attended with great constitutional disturbance, extreme restlessness, intense thirst and loss of appetite, the pulse often up to 120, and full, hard, and jerking; the bowels are obstinately costive, the urine scanty and high coloured, with a strong acid reaction; the skin is often bathed in a profuse, strong, sour-smelling perspiration, which, however, affords no relief; and it is an established fact with the medical profession, that the rheumatic is essentially a blood disease, and that the poison which is accumulated in it appears to be lactic acid. It also contains a *large excess of fibrin.* The urine is excessively acid, high coloured, and contains much uric acid; and the remedy of the faculty in such cases—the treatment by alkalies.

Since the system is saturated with the acid, the most rational treatment is the Alkalies, and it is the most successful—Bicarbonate of Potass, Nitrate, Bitartrate, and Acetate; and I beg to suggest to our President that three or four of our Manchester practitioners should, when they have under their care a patient, or patients, labouring under this disease, they shall collect some urine, and also some portion of the blood, for the purpose of being analysed by some eminent analytical chemist, at the expense of this Association; and I have no doubt, and not the least fear, but that we shall obtain thereby some peculiar poison, or effete matter, that has been secreted in the circu-

latory system; and doubtless, then, this state of the blood will present an interesting subject for investigation.

SYMPTOMS.—The horse stands in a fixed position. If confined to the fore feet, the symptoms are of that peculiar character that they can hardly by any person of any experience be mistaken. All of a heap, is the old phrase used to denote the animal's position—the pulse is full, frequent, and remarkably hard; the respiration seeming to sympathise with the pulse. The horse places his hind legs under him in order to take the weight of his body off his fore-feet; he groans and moans from the severity of the pain, which in some extreme cases lays him completely prostrate. If forced to step forward, he most unwillingly makes an effort to do so; and his method of accomplishing it is expressive of no disease save laminitis. The feet are hot and painful. If one foot be held up—which in some cases it is very difficult to do so—he can scarcely stand upon the other. He does not like to get up when laid down; and if compelled, does so with great difficulty; and he is very unwilling to move from one place to another. Throbbing of the pastern arteries is another well-marked symptom. The mouth is parched, breath hot, mucous membranes vascular and scarlet in colour; parts of his body are in a state of tremor; he is continually changing the position of his feet in search of relief. The pain is explained by the larger supply of blood to the nerves of the part, combined with the pressure of the surrounding textures upon them. It is accordingly most severe when the surrounding textures are most unyielding. With increased heat of surface, great thirst, dry skin, scanty and high-coloured urine, we have the most obstinate and sluggish state of the bowels present.

TREATMENT.—Many different modes of treatment have been recommended; and, reasoning on general physiological principles, the functions of the alimentary canal are so tardily carried on that we cannot insure the operation of a purge under 24 hours, there being no animal but the horse in which acute disease makes such sad havoc in so short a time. Empty his stomach we cannot with an emetic, nor can we purge in a few hours; and, well knowing the obstinacy of the bowels in this disease, our measures must be prompt to act and decisive when they do act; for the grand purpose, if the practitioner desires to be successful, must be to conquer the disease by resolution, as every other mode of termination is unfavourable if not destructive. Consequently to bring about this issue is the aim and desire of every one treating this malady; and as the nature of the disease, its seat, and the disorganisation which it produces, are well known, this result is not so difficult of accomplishment as it may appear at first sight, in proof of which I beg to offer to your notice to-night the treatment which I have found most successful during a lengthened period of practice. It is as follows:—

Bleeding from the coronary plexus. Aconite, M X every two or three hours in half a pint of cold water.

Gentle purge—Nitrate of Potass, ʒii in cold water every time the patient drinks, day and night. New yeast about half a pound two or three times a day.

Externally—Cold water poured on the feet with great force every hour or two, day and night.

Bleeding.—In inflammation there is diminished action; that is, diminished contractility of the small arteries, with increased action of the heart, and the two together keep up that dilated condition of the small vessels which is the essence of inflammation. It is obvious that there are two ways which these minute vessels may be restored to their healthy degree of contraction. The first is, by lessening the quantity of blood to the part, and the second by increasing their contractility. In most acute inflammations both these remedies are required. If the inflammation be recent, the small vessels may recover themselves if once relieved from the undue quantity sent to them by the heart; and in this case the abstracting of blood or the use of depressing remedies will suffice; but if inflammation be chronic, the small vessels may have so lost their contractility as not to recover themselves, though the blood circulates through them in diminished quantity, and in this case we must use such remedies as restore the lost contractility of the vessels, and precisely the same treatment is required in that state to which we give the name of congestion. The treatment of inflammation, then, is twofold. It consists in diminishing the quantity of blood sent out by the heart on one hand, and in restoring the lost contractility of the small vessels on the other. As the increased action of the heart occurs only in the acute form of inflammation, it is in that form alone that general remedies are necessary. These remedies are bloodletting, aided in certain cases by active purgatives and depressants.

Bleeding alone, even though often repeated, will not suffice to subdue the inflammation, for each bleeding is followed by reaction, and that reaction establishes the inflammation.

By combining depletion with depressing remedies, we save blood and avert chronic disease. The great principle to be observed in the treatment of acute inflammation is to subdue it at once, so as not to allow reaction, and to give the small vessels time to contract to their usual size.

Aconite.—Very little has been said or written on the properties of Aconite given in M X doses in half a pint of cold water; it diminishes vascular and nervous excitement. I have observed, after two or three doses, my patient has laid down and been disposed to sleep, which certainly appears to me to secure the desideratum so strongly urged by our friend Mr Greaves, in his remarks on this disease—viz., to get the weight of the body off the feet. I think that object is obtained here.

Large doses produce alarming symptoms and considerable excitement, but in small doses I have often seen the sedative effect almost instantaneous.

I well recollect, whilst attending the lectures of Professor Spooner, that he said, when speaking on sedatives—there was none like Belladonna, for you had two objects in view in administering it. It was the best sedative and at the same time was a laxative, which power no *other* sedative possessed; and I venture to assert that Aconite given with caution in small doses, and well diluted, has in my experience proved the best sedative we have, and stands pre-eminent as a diuretic.

Nitrate of Potassa.—Nit. Potassæ given repeatedly in water I believe to possess the property of destroying or neutralising certain morbid poisons existing in the blood, as well as in a less marked manner to have the power of checking inflammation, which result is attributed, at least in part, to its well-known property of rendering the fibrin of the blood more soluble.

Cold Applications.—Cold water, according to the degree and manner of its application, acts in very different ways. Its general effect on the circulation depends upon its intensity; but when, as in this instance, the feet are hot and dry, it reduces the temperature, lowers the circulation, *soothes the nervous system,* diminishes the *extreme sensibility,* and restores the contractility of the capillary vessels, thereby preventing further effusion, and allowing the absorbent vessels to remove any fluid which may have been thrown out.

Dietetics.—In this disease, as the functions of the stomach and digestive organs are either primarily or sympathetically impaired, and the assimilation of nutriment consequently very feeble, it becomes a necessity for the practitioner to supply such concentrated forms of nutrition as will be most certainly and readily absorbed by the disordered system. I have found these to be, amongst others, two eggs every two or three hours, day and night, in a cupful of cold water, until the fever abates—after which give small bran mashes and the raw swede turnips, or in summer green food in small quantities; and thoroughly to eradicate the disease, along with the change of diet, there should be also secured for the patient a change of locality.

Now, gentlemen, I have very briefly, and by no means pertinently, laid before you a meagre outline of the results of my experience in the treatment of this fearful disease. I therefore earnestly entreat you, neither to discard it at once, because it at the first blush does not appear to follow in the time-honoured and beaten track of our craft—nor to ignore it because the appliances and *modus operandi* of treatment are novel and perchance to you untried. Every new discovery in science and art must, sometime or other, be an innovation, and necessarily be regarded by those who are habituated to the old and long recognised system of things in that sphere, with suspicion and doubt.

But if its pretensions be not investigated, and its merits tested, there is at once an end of all progress. Invention and new appliances of long known powers are the distinguishing features of our age in every phase of life. *Why, then, should our profession be an exception?*

We may be as sceptical as we choose and as conservative as we like, but truth is light, ever expanding, and will shine over our path whether we will walk by it, or in it, or no. And if we fail, being weak-sighted, or blind to appreciate its life-giving expansive powers, other minds and geniuses less prejudiced, will, by experiment, gain experience, and by experience succeed in effecting marvels which might have been our achievements if we had been more progressive.

Let me therefore, gentlemen, urge upon you the necessity of careful investigation into the facts now summarily brought before your notice, and let me induce you to ascertain for yourselves, by actual and careful experiment, the advantage or otherwise of the several appliances which have been recommended as curative agents in this lamentable disease. And I feel confident, that if care be taken in the administration of proper doses, and in a careful diagnosis of the varied forms of the disease, you will not have cause for regret.

General Paralysis in a Mare. By JAMES BAILLIE, M.R.C.V.S., Lauder.

SIR,—Allow me to bring before you a case I had lately in practice, and if you think it worthy a place in the *Review,* please to insert it.

I was called to see a six-year-old mare, the property of Mr Mill, Handsidehill, and on my arrival I found her lying motionless. On inquiry, I learned the following particulars:—The mare had been at Dalkeith market on Thursday—a distance of twenty-four miles—and had returned home on the Friday, arriving at noon. The same afternoon she had gone about an hour and a half in the mill, was taken out of it quite cool, had a drink of cold water, and was put into the stable. Shortly afterward, she was observed to move stiffly, and was walked out some distance; but while doing so, fell down, and had to be placed on a gate and pulled in by two horses. This was about four o'clock P.M. A neighbouring farmer who was sent for, gave a bottle of ale and two glasses of whisky, and advised the owner to send for me, giving the messenger instructions to request that I should bring some strong purgative medicine, as the stomach and bowels were affected.

I arrived about ten o'clock. She was down, with the legs stretched out, pulse eighty and full, active contractivæ (apparently spasmodic) of the œsophagus, stiffness of the neck, the muscles being contracted as in tetanus, the conjunctivæ and scheniderian membranes were reddened, and the extremities cold. The ears were kept in almost constant motion, their movements being particularly active when any noise was made. The eyes were bright, and sight seemed unimpaired. The mare also strained constantly as if for the passage of fæces.

When the legs were pricked with a pin, there was no movement or

other indication of suffering, and when bent up they were suffered to remain so.

Believing that I had to deal with a case of congestion of the nervous centres (spinal cord,) with constipation, and probably with inflammation of the bowels, I attempted to give an aloetic ball, but failed, owing to the spasmodic closure of the jaws. In consequence, I gave thirty drops ol. crotonis in a quantity of linseed oil and enemas. Having abstracted six or seven quarts of blood, and given 4 oz. liq. ammon. acet., I had her warmly clothed, and she shortly broke out into a very copious perspiration, by which she seemed greatly relieved. As the pulse continued the same, I abstracted three quarts more blood two hours later, and gave twenty-four drops of Fleming's tincture of aconite.

I remained with her the whole night, giving during the course of it thirty drops more ol. crotonis, and repeating the enemas every hour and a half. These brought away a considerable amount of indurated fæces. I also had her turned from one side to the other, to excite the action of the bowels. On leaving in the morning, I gave orders to continue the enemas, turn her once, and keep her well clothed.

I visited her again at five P.M., and found that a considerable quantity of dung had been passed throughout the day, but all in a hardened condition. I gave thirty drops more ol. crotonis in a quart ol. lini, and passing the catheter drew off a very large quantity of urine of a natural colour. She had evidently passed none since taking ill. Before leaving I repeated the dose of croton oil, as I could hear no motion in the bowels, and also ordered the enemas to be kept up. The perspiration continued free, and the tenesmus persistent, often causing the return of the enemas as they were administered. During the day the mare had regained the use of the legs somewhat, as she moved them backwards and forwards; but she never attempted to rise. She also occasionally lifted her head and looked back, and moaned a good deal. I would have applied hot cloths to the abdomen had I not considered the costiveness due to paralysis of the intestines. The moderation of the paralysis I considered in great measure due to the abundant perspiration.

The pulse, which had all the while ranged from eighty to ninety per minute, was now becoming very weak. The mare moaned a good deal, and appeared very sensitive to noises.

Having again turned her, and given orders to administer a bottle of linseed oil next day, if there was no improvement, I left at 10 P.M.

I may state that deglutition was difficult, and that all along, in order to make her swallow, I had to manipulate the throat, keeping the head as well out as possible.

The patient died next morning at six o'clock, having struggled a good deal during the night, particularly with the fore-feet, as evinced by the marks on the stones. On the following morning I made a post-mortem examination, and noted the following particulars:—On opening the abdomen, the walls of which were loaded with fat, a con-

siderable quantity of reddish serum escaped. Discoloured patches were seen along the course of the ilium and on the mesentery, but these were by no means extensive. The omentum had throughout a similar appearance. The spleen was large and very spongy, and the liver normal. In removing the large masses of fat around the kidneys, their capsules were torn off. The organs themselves were extensively diseased, the cortical substance being red, rough, or granular, and easily broken down. The bladder was quite empty, although the mare lived thirteen hours after the urine had been drawn off by the catheter.

The lungs were congested, but not inflamed, and the pericardium contained a considerable quantity of bloody serum. The heart itself, with its valves, were quite healthy, and the pleural surfaces were in a similar condition.

On opening the stomach I found it empty, with the exception that it contained a few straws, evidently recently swallowed and unmasticated. The small intestines were empty. The cœcum contained some softened ingesta, and the colon was full, but not over-filled, its contents being rather dry.

My examination was conducted, under considerable difficulties, in a field covered with snow, and, in addition to this, I was pressed for time, so that I was unable to dissect out the great nervous centres. I regret that the case is thus rendered incomplete, although there can be little doubt but that their examination would have disclosed the existence of congestion, and probably red softening of the spinal cord. The difficulty of deglutition seemed to imply that the medulla oblongata partook in part of the diseased condition, but the remainder of the encephalon, I believe, was healthy, as the functions of the eye, ear, &c., appeared normal, or only over-excited. In the character of the pulse, fever, and loss of movement, the case bore a considerable analogy to puerperal fever in the cow, differing only in this, that the brain proper was less affected. The draught of cold water, when the mare was already exhausted by a long journey and subsequent work, had, I believed, caused a revulsion toward the nervous centres, inducing congestion and sudden paralysis. The kidneys appear to have become involved consequent on the disease of the spinal cord, as the urine, drawn off twenty-four hours after the onset of the disease, did not appear altered in any particular. The disorganisation of the kidneys, too, though extensive, was apparently of no long standing.

The mare was very fat, but quite able for her work, and likely to be well used.—I am, &c.

ON NAVICULAR DISEASE AND FOUNDER.

By Joseph Gamgee, Senior.

The following is the substance of a Paper, with verbal changes, which was read at the Veterinary Association, in the New Veterinary College, on March 3.

The above denominations which I use, in preference to others also in vogue, for conveying to the mind, notions concerning the characteristic features of different pathological affections to which horses' feet are prone, may require explanation on my part, with some statement of the reasons which induce me to couple together two such formidable diseases of the foot, as those which I submit for deliberate consideration and discussion at this meeting.

With the knowledge that I am exposing myself to be questioned, as all men do who, not content with matters as they stand, raise objections, point out errors, and endeavour to contribute some share to the required amendments and advances; I do not, like some, believe that those who work, should do so, heedless of all the erroneous doctrines in vogue, which are perpetually being promulgated anew. To such indifference on questions of the first importance, I profess to share no part; neither my innate disposition, nor the discipline which experience has imposed, prompt me to compound with adherents to false notions, because they paid to be taught them. None are so proper to point out the quicksands, as those who have worked through time and under disadvantages, to escape from them.

On the discovery made by the late Mr James Turner, of the existence of a diseased state of the navicular bone, which he proved, by adducing cases and specimens, was not of unfrequent occurrence, he called the ulcerated condition of the bone "navicular disease;" and the phrase was most happy, owing to its simple plainness and neutral import, in so far as the adoption of the word only referred to a phenomenon without committing the user of it to any doctrine, physiological or pathological. For these reasons, and believing that the subsequently compound Latinised word, "Navicular arthritis," is objectionable on the grounds noticed, I see good reason for keeping to the original words, and to reserve the freedom of discussion on the pathology of the disease, unfettered by words.

Founder is an old term, in use to designate a diseased state, accompanied by lameness, and which has been often described, though not satisfactorily defined. Founder, as applied to the case of a lame horse, would seem to indicate inability to move, as is clearly the meaning when the same word is applied to a stranded ship. In French veterinary literature, the word "Fourbure" is of old standing, and is still in full vogue,—clearly applied by our neighbours in the same sense as intended when rightly used by us. It is uncertain whether "founder" is a corruption of "fourbure," or whether both words originated from a common root.

With their usual clear way of describing symptoms, our neighbours across the Channel tell us, that "La Fourbure is a disease, while labouring under which, the horse can hardly walk, and scarcely can flex his limbs, which seem to be all of a piece. He appears to lack the equilibrium of all his limbs, and one would think that all the articulations were made immovable when the horse is made to turn."—*Lafosse, Dictionaire Raisonne D'Hippitrique,* 1775.

In our own country, "founder" has been used, in reference to conditions differing in the character and supposed seat of disease. At the beginning of the present century, horses were said to be foundered, and distinction was drawn between chest-founder and foot-founder. It was not until Turner had shown that navicular disease was a common sequence in the cases, pronounced chest-founder, that English veterinarians began to limit the term "founder" to typical cases, such as have been characteristically described by the learned French author of the last century, already referred to. In its properly defined and limited application, "founder" is, I believe, still the least objectionable of any term in use with us, and for precisely the same reason as I have assigned for preferring the words "navicular disease." In both cases alike, I say keep to the original or older terms, especially as neutrality is of moment, in preference to taking up with the terms, "inflammation of the laminæ," or "laminites,"—phrases intended to convey the ideas of their originators, on the pathological character of the disease.

When men talk learnedly about "navicularithitis," and "laminitis," or of other conditions of the feet, where lameness is the manifest symptom, and amongst whom no two members can be found to agree, it may fairly be inferred that the matter is not in a satisfactory state. None, however, but those unacquainted with such questions should be surprised at the conflicting state of opinion. If the subject was understood, though shades of difference in the opinions of professional men would still be found, on all the more essential points agreement would be arrived at.

Can any rational man believe that under ignorance of the normal functions of the foot, the diseased conditions which supervene, are to be comprehensively seen into? The prevalent *ideas* are that one pair of bones are attached to a larger one by a yielding medium substance, which, by stretching, admits of their descent; and that another pair of bones (the sessanoids) are suspended by an elastic ligament, endowed with considerable elongating properties; and that the navicular bone is pressed down on to the tendon beneath it, which in turn reposes on the frog; and lastly, that the coffin bone is slung by elastic medium bands to the inner surface of the wall of the hoof, that these bands (the laminæ) allow by their stretching properties for the bones to descend, (if one descends, all must,) to admit of which the sole of the hoof must be cut away, and otherwise weakened to avoid obstruction (query, support.)

Now, I ask, is this the material to harbour in men's brains as a

foundation on which to build a superstructure of any kind—either of normal actions or diseased conditions? No; the anatomy of the foot must be understood; from phenomena, we must arrive at systems, and then we may learn pathology—knowledge of healthy actions first, and then the altered states—disease, causes, and sequences—may be understood.

Navicular disease is met with chiefly amongst the fine breeds of speedy horses, with whom, and in their special kinds of work, a more constant energetic pressure is kept up in the region of this bone. The causes of this disease, like those of most others, are essentially of two kinds—viz., predisposing, and actual or direct causes. The first consists in the management of horses from the time they are foals to adult age; well formed, strong feet, all other things being the same, withstand the effects of after-causes the longest.

Bad shoeing and fast work under weight or draught are the most common exciting causes of this as of most other diseased conditions of horses' feet. Bad shoeing is a vague expression; but I call all bad, in degrees that is not done by system, subordinate to the necessary knowledge of the foot. There are some bad habits which have found their way into the practice of shoeing, and, indeed, have been all along enforced systematically, which may be pointed out in this place, though I cannot go into details on the art in this essay. Paring of the soles and the weakening of the hoof, either by instrument or softening, should be alike avoided; as no skill is needed in attending to this step, alike conservative and remedial in tendency, I submit it with recommendation that it be taken as a rule applicable to the case of all horses.

Navicular disease never occurs suddenly, is never caused by bruises from stones as alleged, nor does it appear as a primary affection. The coffin bone having the whole weight and exertion to sustain, is always the first to suffer, and it is when an altered position from the normal state takes place in the coffin bone, and the other component structures of the foot relatively, that derangement of functions and stress of pressure is imposed on the navicular bone. The coffin bone undergoes more change in physical formation, and that more rapidly, than occurs in any other bone,—I may say of any animal,—and that for the reason, that no bone is placed under so many complications of adverse influence and by misapplied art and exertion combined.

The semilunar crest, and the normal asperities of the coffin bone become absorbed under the influences prevalent, by which the attaching processes for the tendon, the planta band and the frog, are all weakened and positions become altered; the navicular bone in the case is more and more called on to bear pressure, when its normal bulk would lack space; therefore absorption of its substance takes place from within, until at length its outer surface breaks down; being always on its lower and posterior surface where the ulcerated apertures one or more are seen, whence limph issuing becomes attached to the tendon, by which effort of nature the structures become in some

measure fixed together, and the otherwise unsupportable friction is diminished.

Treatment.—Ours is all of a prophylactic kind; firstly, preventive measures are the great resource,—the taking care of the stable, ere the steed is lost, is our watchword. But cases will make their appearance, and though not one in ten of those pronounced to be the navicular disease are of that type; yet in various stages of progress cases of navicular disease frequently appear. My remedies in these cases consist in the taking of very much the same measures as I adopt for prevention, or rather for the maintenance of healthy action regardless of any particular disease. I remove causes, *i.e.*, in the first place the shoes, and withdraw all ascertainable causes of pain as soon as possible; rest and some fomentation to the feet are amongst the most effective means. Continued rest in a loose box may be necessary for two or three weeks, during which time the feet will acquire form and strength, under such management as I carry out—viz., no softening application after the first two or three days, when circulation of the blood will have found its equilibrium over the foot, after which cleanliness and care and abstaining debilitating the hoof is observed. But, we may say, my friends, this is not surgery. Would you not bleed, blister, insert setons, and if the lameness continued persistent, unnerve the horse? I shake my head and say—No! Well, is it pretended that I can cure all cases submitted to me of the character under notice? No. Then what is to be done with the incurables, are they not to be submitted to the orderly routine of successive operations? I can hardly be made to comply, and for the following reasons:—I saw so much of that which is called the surgery of these cases in my early days, such torture, butchery, and sacrifice of property, that I tried what I believed then the more rational mode of procedure, and have been rewarded by great success; the few cases of protracted and advanced disease, which after due observation and trial I diagnose as incurable, I advise to be put out of their miserable state. They are very few, since all but a fractional part are redeemed to a state of ease and usefulness by the measures thus employed.

Founder, the distinguishing feature of which I cannot better portray than by referring to the description given of symptoms, published by the distinguished Lafosse in the last century, is a disease which occurs most in the heavy breeds of horses; I advisedly distinguish between heavy breeds, viz.,—round formed, punchy bred horses, and those of high stature, or with reference to the actual weight of the animal. It is the mode of breeding and management that furnishes the predisposing causes to founder; and which relatively exempts horses from causes of lameness, by which from the same stock, soft, lumbering horses, with flat feet, are produced, under indefinitely bad management; the cob horse of fourteen hands, and the coach or cart horses of seventeen hands, may alike contract in their early ages the predisposition to all diseased states common to flat feet: the words, "flat feet," should always to be taken in a relative, and not a positive sense.

The description of horse under consideration, while prone to almost every form of disease of the feet, of which founder is the most formidable, are withal almost exempt from navicular disease; and a few words in this place on phenomena comparatively, may help to show the existing causes in each case, illustrative of the fact that through predisposition by breeding and conformation, different effects and types of disease are brought on under similarity of treatment and work. It has been said already that the speedy, well-bred, energetic horse is prone to navicular disease; that he, with greater leverage construction than the common bred, exerts more force on to the navicular bones, and that all disturbing influences tend to bring about effects in degree, until the extremes noticed become the results.

While the flat-footed horse, with dwelling action, cannot give that intensity of force on to the navicular bones, which causes the disease, he bears on a greater surface with a less substantial foundation than the strong footed. The want of the natural, strong arches of the pedal-bone and hoof, the two structures which act together, and which mainly govern the position and functions of the complex organ, the foot, calls for artificial provision to sustain the whole; and proper shoeing and excessive moisture constitute our means, whereby in these cases, as in the other types, the effects brought on by multiplied adverse conditions may be avoided. The horse, with hoofs and pedal-bones flattened under the ordinary modes of managing the feet, which give little support, and much unnatural obstruction to functions, is in a state progressively getting worse,—he goes, to use a comparative phrase applied to analogous cases in man, *whole footed.*

This subject may be made more clear if we compare two bones of similar class and breed of horses. Say the thorough-bred; for although these are the least liable to founder, still, relatively one with another they differ, and to that extent may be studied with profit. A race horse, with a shallow, flat foot, seldom runs on, as an aged horse, though many with feet so formed are large powerful horses; and when the course is wet and soft they often win the race. Such feet, like those of the duck, in water, are in their element; but change from swampy to hard ground, and the horse, physically inferior in other respects, but with strong, arched feet, wins the race. According to predisposition, and the accumulation of causes, absorption of the coffin bone goes on —the thin, weak sole renders the prominent points, margins, &c., of that bone incompatible with other abnormal phenomena; the defective, mutilated hoof, always in conformity and conforming to the coffin bone, requires that that bone should have its sharp asperities removed, though at the expense of strength, energy, and action, and accordingly absorption does the work, as a provision of compensation. The horse thus loses form, speed, and power; the active riding horse becomes a poor harness drudge; the one that could trot with ease ten miles an hour, can, with much pain and difficulty, only do seven; and the cart horse that could walk away with his load nimbly, at length goes kneeding the ground, and dwelling on the posterior regions of his feet, while he is unable to revolve them, to use the

anterior region, the point where his powers should be exerted, with full energy and force.

We have now come pretty close to all the conditions of chronic founder, and only want some little increased exertion, fresh exciting influences from shoeing, or a little more time, when ulceration of the pedal bone having proceeded to a great extent by slow degrees, now becomes more active; and all the acute symptoms, indicating inflammation of the foot, with general derangement of the system, are set up. This stage, acute founder, may, and sometimes does occur, without the slow process of change above noticed. We never, however, have effect without causes; and there are usually several in operation at this juncture; the local, as regards condition of the feet; general, as regards the constitution of the animal; and immediate, as in the case where violent exertion has been in force.

These cases of intense suffering to the animal, and rapidly progressing destruction of normal organisation, have been called Laminitis, an absurdly applied term, given to represent an idea, as already alluded to—an idea that, instead of being supported, the coffin bone is suspended. Reverse the notion, and admit, since, whether admitted or not, nature's laws being omnipotent, that sole of the hoof, with the arches of the coffin bone, support the burden; give place to these views, and the subject may be contemplated more profitably, when it will be seen that, instead of the connecting medium between the pedal bone and cartilages being the seat of the affection, the lower and anterior region of the coffin bone is invariably the seat of suffering, the enveloping fibrous structure becoming simultaneously affected. Meanwhile absorption and shortening of the bone goes on, its substance wastes, its removal being nature's object, and the posterior region, the foot, is alone sought to take the whole or chief burden. It would be too much to attempt in this paper to enter on all the metamorphoses that follow, comprising even death of the animal; or to enlarge on the various degrees of restoration in other cases attainable. Suffice for the present to show character, causes, and the rationale of the subject.

I have made selection of one, from amongst my collection of pathological specimens, very typical of the disease under consideration; the subject was a cart-mare, whose fore-feet I obtained, the bones of one of which furnished the specimen drawn for the accompanying woodcut. I never saw the animal until after she had been taken alive to the slaughter-yard and was killed, when I learned as much as can usually be relied on in such cases from mere report, which amounted to the statement that the mare had been many months excessively lame, that she had been kept at work until recently, and when impossible to proceed longer with torture she was destroyed.

The specimen represented on other side, exhibits in a marked degree the wasted condition of the coffin bone over its lower surface, under which weakened state, with corresponding mutilated state of the hoofs (the sole) in particular, and from the cruelly imposed exertion to which the mare had been kept, the front of the bone has become bent upwards, or, more correctly speaking, it is partially fractured, after becoming so reduced that the plates of bone composing the planta arch became torn asunder, and a bending of the remainder and upper part of the pedal bone followed.

My collection of morbid specimens of the foot, and of pedal bones in particular, all show that the planta region is the seat of disease in founder; and knowing that the conclusions I have arrived at, by the only method by which such questions admit of solution—pathological researches—have not yet found many converts amongst the members of the profession, through their having become early imbued with very different notions, I challenge any one to sustain their long-cherished hypothesis.

Words and opinions count for nothing in my estimation, when these are opposed by phenomena; therefore let any one produce the foot of a foundered horse, or call the disease what they please, laminitis will do for the occasion; and let that foot, or any number of feet of the kind, be prepared in a proper way, so that its true pathological state is shown, which cannot be until the pedal bone has been divested carefully of its membranes; and let a single case be shown me, in which inflammation and ulceration (for the latter succeeds the first in this disease) has existed over the upper connecting surface of the pedal bone, in which the inferior surface is found normal—show me, I say, one case, and I will admit that, without disputing about exception, as evidence against my position. But I will reverse the point, for my abundant evidence and proof enables me to say, that not one case will be found, even in those extreme, in which a third of the bulk of the coffin bone in front has disappeared by absorption, in which the course of diseased action has not proceeded from below upwards, and from the anterior lower margin backwards; and to that extent when the whole lower part of the front of the pedal bone becomes involved, and only its joint articulations and posterior parts are left for the most essential offices in that deplorable existence of the animal.

TREATMENT.

The difference we find in the pathological state of cases of founder is more of degree than of kind, and to that extent brings us to form different prognoses of the result to be expected, and the time required to effect a given measure of relief, as well as the best mode of procedure in the case.

There is no disease to which the horse is liable, that is more controllable by a right application of veterinary skill, than the whole train of cases of founder, beginning with the sprawling, soft, flat-

footed colt, off the swamp or wet dung of the farm-yard, to the convex or pummaced-footed horse, with the various complications which intervene and accompany these.

The whole train of consequences giving rise to deformed and diseased feet is due to physical causes; and to that branch of veterinary art and science which assumes to take care of horses' feet, whether in health or with reference to their restoration, should devolve the labour and credit pertaining. These cases require real knowledge and manual dexterity, and if one man does not embody all these, two must be employed. Sham knowledge is no use, and only perplexes; as a matter of course it is understood that shoeing is the procedure which, least of all, admits of being done well in all its details by deputy; and, I regret to add, that the difficulty of learning this branch renders it unfashionable; therefore, to prescribe is of little avail until some common ground is established as to how and where it is to be taught and learned, and what the recompense for services of such importance. The art of shoeing, well carried out, the feet sustained and protected, with freedom of functions provided for, nine-tenths of all cases of founder will be prevented, and the whole controllable thereby.

All horses' feet, and flat feet especially, should be kept dry and clean, as a man would keep his own hands and feet. And the effect of excessive moisture, encountered in their daily employment, should be provided against. But, will say my opponents, horses' feet were designed to go in wet and dirt; yes, but altogether of another kind and degree, and then with hoofs in a condition to withstand it. Our horses, with pared and rasped feet, are often exposed in a quagmire for many hours together daily, and exerting their weight on a hoof not in a state to bear it. Let a man walk with a wet soddened boot, and then change for a dry one, how comfortable he will feel by that change. The case is illustrative of the fact that artificial usages call into play other resources of art, to counteract the evils that would otherwise result; and, as a counter protection against external noxious influences to the hoofs of horses, that of moisture in particular, I use an ointment which has been productive of advantageous effects in my practice for the last twenty-five years. This hoof ointment is composed thus: take two parts of mutton tallow, to one of Burgundy pitch, melt these together in a water bath, and then add one part of Barbadoes tar. If this ointment is rubbed well into the sole and whole hoof with the hand, the feet to be clean and dry at the time, the protecting and nourishing properties will prove very decided. About once a week is often enough, in general, to apply it, and I usually recommend it to be done on a Saturday evening, because most of the horses standing in stable next day benefit the more by it. People think that anything is good enough for horses' feet, and accordingly all sorts of offensive stuff is used,—kitchen stuff, common tar, &c. I should as soon think of applying such material to my own hair as to a horse's foot.

Acute founder, with all its concurrent associations, presents symptoms of inflammation of the feet, and general constitutional disturbance, viz.,—fever, with throbbing pulse, and such a case is not encouraging for the unprepared practitioner to look at, while the agony of the horse is most distressing.

The measures I adopt in such cases with promptness in application have been tested for effect, and are not recommended for great display. Some old friends may perhaps put these questions, Do you bleed, apply poultices, or ice to the feet? I reply, No, I do nothing of the sort. Guided by all the phenomena observable and the history of the case, I proceed generally and locally, and applying to the last of these first, I remove all extraneous substances and matter from the feet, whether of iron shoes, leather soles, or of filth of all kinds. A loose place for the horse to rest, move, and lie down in, is sought. An aloetic laxative ball is given, and clysters, which are repeated at intervals of two or three hours, while the urgent symptoms last; and warm water fomentations are applied to the affected feet, either by placing one foot at a time in a pail, if the horse can stand, and if lying, flannels wrung out of warm water are applied to the feet.

All forage should be removed from the rack and manger, and only the potions prescribed given at proper intervals,—viz., tepid water, with a double handful of bran to about a gallon, to be given freely; and good meadow hay in small quantity, say six lbs., in the course of twenty-four hours, is all that is beneficial, until the febrile symptoms abate, and the horse's appetite augments.

If the horse is able to stand, he will in some instances be placed more at ease, and altogether the better for the affected feet being properly shod; the good effect arises through obviating the contact of the prominent or more or less flattened sole pressing on an uneven floor, since the planta region of the foot in the case is engorged with blood, and the vascular structures compressed between the sole of the hoof and the pedal bone are of twice or thrice their normal thickness; with deposited lymph in some cases contiguous to the hoof, so that direct pressure of the planta region on the ground cannot be borne, and it is to obviate this that horses instinctively endeavour to bear wholly on the yielding structures of their feet—in other words, their heels, while the front of the foot is raised in the air; and thereby flexion of the limbs, so accurately described by Lafosse, is as much as possible avoided. Our object should be to afford the means of free circulation of the blood, which is a chief want in these flattened-down feet, and one of the phenomena giving rise to the acute stage of the disease; therefore, by setting the outer aspect of the sole free from pressure, and making an artificial space between shoe and sole, a substitute for the natural arch of the pedal bone and sole is given. In adapting the shoe, the aim should be to bring it to bear on both the posterior extremities of the wall equally, ample cover and proportionate substance of iron is required, and no direct pressure must be

sought to be imposed on to the frog, as is often inadvertently done; and only knowledge of a very different kind to such as has prevailed on the physiology of the foot can teach the reason why bad shoes and modes of forcing pressure on the frog are insupportable. So far placed in a favourable condition, or in the less unfavourable cases, where the foot is placed at ease by being set free from the shoes that caused pain, and allowed to stand barefooted, the fomentation being discontinued, and the hoofs being kept free from moisture, the horse being kept on firm flat surface, with a thin covering of litter, soothed locally, and nicely managed hygienically, the condition of the feet will change rapidly; and since perhaps nine-tenths of my readers will, in accordance with their apprentice-imbued notions, conceive no other way of getting rid of the accumulation of blood and lymph in the foot but by plunging in an instrument and abstracting it largely, I will tell them what takes place, and how, after all exciting causes whatsoever have been removed, relief to the horse is attained within the first six hours of treatment, which goes on progressively in increased ratio once the tension is relieved. Once secure the free circulation of the blood, which was obstructed by physical causes, and tension diminishes, and thereby a new cause, which had been brought on, is being removed. Grant that, we have lesions left, and alteration of structures to be restored, but which nature's provisions at once set about to accomplish; and as the veins and lymphatics carry into the general circulation the local accumulation, the arterial system brings new material of life to fill up the breaches. Therefore we have only to think about our part, remove causes, and nature will do hers, and the disturbed balance find its equilibrium. Having advised in accordance with the practice I follow, shoeing for the feet which are unable to bare pressure on the sole, and for the less urgent cases which can bear it, and will improve by the healthy stimulus, there is a third class, where the horse is so bad that he cannot stand to be shod. To such I give a nice level bed of used litter, into which the feet press during the short interval of standing, and on which the horse will repose and stretch himself during the greater time; while in that case also relief will come, under the general treatment prescribed, when the case will become one of those noticed already, to be shod or not at a given time, according to the state of the feet.

Remarks.—I am not so indiscreet as to expect that my self-imposed work, of devoting my best efforts to the conservation and restoration of horses' feet during the greater part of the day, of prosecuting anatomical and pathological researches at other times, with endeavours to teach what I know and daily learn, will have much weight with readers. Nor will they think that the work continued by the midnight light is worth any consideration, all of which I freely admit. I am only, and but poorly doing my duty, for which I lay one claim—that of being allowed to record my views without curtailment.

I have been trying for many fast fleeting years, to discover from what source or direction, new, better, and more extended knowledge

and discipline could be drawn into the veterinary profession; and the most recent inauguration which I hailed with pleasure and hope, was that of veterinary associations; and while I still hope, I take warning that we must not expect the good to come in the lump. None the worse in the long run; the bringing of men together, and affording the opportunity for free exchange of ideas, is a most important step, worthy of my friends, among the first who took it. Associations always set forth the true character of the body they represent, the greater of all of them embodying the wisdom of the nation; the rest that of sections of the community. Veterinary associations take their place amongst the bulk, and will in due time show the character of our common body, which it is their object to ameliorate.

Whilst some members of these associations enlighten by their suggestions, others perform, as perhaps at this crisis, an equally useful task, that of showing and proclaiming the nakedness of the land. Of such have been pre-eminently the discussions introduced and sustained on the subjects which I have, however inadequately, endeavoured to treat on, in this paper. I don't think that barbarism was ever set forth more plainly, than it is depicted by some of those who presume to possess a knowledge of the way to preserve sound, or how to cure lame horses. The last new doctrine that I have seen lauded forth, is that of casting and tying down horses with inflamed feet. I knew of the irrational practice sometimes adopted of hanging horses up by slings, when in that condition, by which irrational proceeding, through the gravitation of the blood, and the impossibility of corresponding facility in its return, the state of the animal was made hopeless.

Veterinary associations and periodical literature will, I believe, lead to changes toward a better system of knowledge, and application of it, than has yet been established in veterinary practice among us. Free intercourse, facility of giving widely-diffused effect to facts and ideas, will show in time the true state of matters. The prerogative of speech, and permanently giving effect to thought and knowledge, vouchsafed to men alone, was not given to be misused. Amongst the aggregate of associations the whole comes out, and the absurd is quite as much wanted as the more rational and positively true.

Amongst the members of the veterinary profession in this country, few have spoken openly, still fewer have written; but it is by those who speak and write that the whole body is estimated, and, I believe, rightly so. If only five give effect to their views, and five hundred remain passive and silent, the latter must be held as agreeing with their self-constituted deputies. And on questions deeply affecting the credit of the veterinary profession,—affecting its status, and the services it could render,—I say, in the words of Garibaldi, "Those who are not with us must be looked on as against us."

REVIEW.

The Ox: his Diseases and their Treatment, with an Essay on Parturition in the Cow. By J. R. DOBSON, Member of the Royal College of Veterinary Surgeons. With numerous Illustrations. London: Longman, Green, Longman, Roberts, & Green, 1864.

VETERINARY surgeons in this country have shunned the writing of books. Some have written nothing who might have published much to the benefit of their profession. Others, on the other hand, have made attempts; and whether judged on their scientific or practical merits, as a rule we can only record instances of ludicrous failure. Mr Dobson has published a treatise to supply what he calls a deficiency, viz., "A complete treatise upon the Diseases of the Ox," no such work having "been attempted" "since the elaborate work of the late Mr Youatt." Poor Youatt! It is a quarter of a century since he laboured to create out of chaos a connected history of the breeds and diseases of cattle. His work contains, of course, much that we now condemn. There are errors in it of no small magnitude; but be it remembered, it was the first work in any tongue embodying so vast an amount of knowledge on the ox and its diseases. It has been translated and extensively quoted in various countries, and is now worthy of being re-edited by some one who can bring to bear on the work some of the zeal and industry of its original author.

Mr Dobson has not done for us what Youatt did. What induced him to write is to us a mystery. We are too charitable to believe that he had the presumption to fancy he could supersede our old text-book on cattle. Perhaps he wrote, because, as he tells us in his preface, he has had "nearly fifteen years' experience in country practice." Had he not told us this, we should have supposed he had not been engaged beyond fifteen months in the study, practical and theoretical, of his profession. London publishers bring out neat books; they are determined to have something to look worth buying; and too often they trouble themselves less about the real abilities of authors than about the important question of aptitude for book manufacturing. There is something good in Mr Dobson's work, but that which is good is not Mr Dobson's. There are some good illustrations, which the Messrs Longman had ready access to, and in every other particular the publishers have done their part of the work well. We cannot say as much for the author.

Without a word of introduction, the first part of the treatise before us refers to the organs of respiration and their diseases. Thirty-three small and broadly printed pages exhaust this part; and as a specimen of the whole, we may refer to a description of the larynx, which is said to be "an *irregularly*-shaped, cartilaginous box situated at the upper extremity of the windpipe, and composed of *rings* of cartilage, slightly overlapping each other, and connected to-

gether by *tough* fibrous tissue." This is a fair specimen of the anatomical descriptions in the work, and the pathological details are no less extraordinary. We are told, for example, that "when the larynx is affected by inflammation, it is known" (we presume the larynx is known) "as laryngitis. This, however, is so exceedingly rare as a distinct affection, and the symptoms and treatment so closely resemble bronchitis, as to render a separate description unnecessary."

Perhaps our readers may imagine Mr Dobson has given ample information under the head Bronchitis. All he says about the symptoms and diagnosis of this disease is as follows:—

"The symptoms of bronchitis are, quickened respiration, attended with a wheezing sound—in more advanced cases increasing to a grunt, accelerated pulse, and the general febrile symptoms noticed under Catarrh. There is also cough, frequent, and attended with an effort. The discharge from the nose, at first limpid and clear, as the disease advances becomes thick, and in the latter stages mixed with *pus* or matter; but so prone is this disease to run on to inflammation of the lungs and pleuro-pneumonia, that, as before remarked, it is seldom seen in its pure state. As, however, the treatment of this affection and inflammation of the lungs are very similar, its diagnosis, as a distinct disease, is not important."

Such is the information furnished by a man of fifteen years' experience. There is not a word on that important disease, croup in calves; and under the head Hoose, we are told that the worms in the windpipe receive the name of "Filariæ bronchiales," whereas the worm which infests the calf's respiratory apparatus is "Strongylus micrurus."

We have marked many passages of a similar character to those quoted, but we fear that our readers' patience would be exhausted if we were to reproduce them. We may be permitted to add, that if Mr Dobson's practical experience does not seem to have been great, his learning is of the most meagre kind. The *heaps* of facts which he could have gleaned from the veterinary and agricultural periodicals of the last twenty or thirty years have been sadly neglected, and Mr Dobson has not carried us a single step beyond Youatt's days.

In conclusion, we may say that we have no doubt the Messrs Longman, as good publishers, will sell "Dobson on the Ox," widely and to their profit. We regret that its purchasers will get so little value for their money; and as it is intended for the farmer and stock-keeper, it may cost its readers much from the crude and vague character of the information it conveys.

The Veterinary Review and Stockowners' Journal.

THE ROYAL STUD.

In the opening number of the *Sporting Times*, we find the following critical report given of the Hampton Court stud, after inspection, which we transcribe, because it is in our own way, and belonging to a question which we raised long ago. The editor says—

"We walked through the whole of the paddocks; inspected all the mares and foals; examined the hovels and boxes; criticised the mode of drainage, and decidedly objected to the water. The glandular swellings about the neck of the yearlings when brought to the hammer have long been a reproach to the management at head-quarters. Considering the prices realised for the young stock, and the enormous profit which is annually made thereby, it would not be too much to expect, that if the spring-water under the paddocks is so unfit for blood stock, that a supply from some purer source ought to be brought by conduits to the paddocks, and the present pumps demolished altogether. The expense of bringing water from the Thames by means of pipes could not be very large, and the outlay would soon be repaid by an improved state of health of the young stock. 'Derbyshire neck' is always unsightly, and the unsightly appearance is not the only evil; the cause of the cervical swelling must operate on other parts, and to a certain extent damage the nutritive powers."

Although we do not participate in the editor's antipathy to Blacklock and his descendants, admitting, notwithstanding, such failure at the stud as that of Charles XII., (and the best of horses having occasionally left such a blank,) it is not on little differences of opinion that we are going to dwell, but on such a question as the above, which the editor has re-introduced, and which merits, we believe, public, no less than professional attention.

On the 4th of June 1864, a letter from Mr Joseph Gamgee appeared in the *Sporting Gazette*, which was reproduced in the *Veterinary Review*, in which the case of the filly Saragosa, whose pastern bone was reported to have been fractured when running for the

Oaks, was discussed; and we here reproduce that part of the letter bearing on the question, introduced for the second time by the spirited writer above quoted:—

"There is one source of information bearing on the subject, which lies within the reach of the public; it is that which the Hampton Court paddocks will supply. I would suggest that, in the interest of science, a report be made of the number of foals and yearlings which have fractured a leg whilst in those paddocks, making the inquiry extend over the last ten or fifteen years. If I am not greatly mistaken, we shall find a significant percentage of those accidents in all the stock that have been bred there, and that few years have passed without a recurrence, and those quite apart from any exposure to violence. We also find that the Hampton Court stock are subject to an enlarged state of the glands of the neck, so much so that it has been named the Hampton Court deformity; it generally subsides after the stock has been placed in good training stables for some months. This glandular affection seems to me inseparable from some abnormal state of the constitution, and especially as connected with the condition of the bones. When facts have been made out, and the number of fractures that happen to the stock before they are put into training ascertained, a scientific investigation should be set on foot; this should, I suggest, be conducted simultaneously by chemists specially versed in two branches of that science—viz., by the agricultural chemist, who would examine the soil, its produce, and also the waters, and by the animal and pathological chemist, who should examine the secretions, &c. Then comes the question of topography and space, concerning which my own researches are available for reference. If these inquiries were to lead to our ascertaining the causes, the nation would be enriched thereby, infinitely more than by the amount of cash which the Royal treasury would receive by any number of annual sales of young stock produced there.

"Without presuming to be well informed as to the average performance of the produce of the Royal paddocks, I can but think that we shall find the best of them—mostly two and three year old performers—smart horses, but few of them run on. I think that if we note all the stock from Moses's year to the present time, we should not discover the like of Stockwell, Rataplan, Fisherman, Saunterer, Caller Ou, and the little dwarf Borealis. And yet no one can deny that some of the best mares in England have always been at the paddocks, and that a most judicious selection from the best stallions in the kingdom has always been made, irrespective of those kept on the spot from time to time." . . . . .

Ten years ago our attention was first drawn to the glandular swellings, exhibited in the necks of almost all the yearlings of the Hampton Court stud. To our inquiry into the general merits of the horses which

had come from the Royal stud in former seasons, and which had shown similar affection, only vague replies were elicited, such as, "they soon outgrow it when they get into training."

Obvious signs served to advise caution and delay in forming independent judgment, after facts had been made out sufficiently. We attended the annual sale, and saw the highest prices given we had ever heard bid for yearlings—proof of the esteem in which the stud was held by the aristocracy of the turf.

In 1856, we particularly noticed the yearlings belonging to Her Majesty, and also to Mr Greville, and were never more surprised at a sale of horses than to see a dark bay or brown colt, with nothing about him very attractive to us, but, on the contrary, exhibiting large goitre, with which we should hardly have taken him at any price. A high bid was made, succeeded by others, and the price of the colt went up rapidly, not by 10s. but by 50 guineas at a bid, until he was knocked down for 900 guineas, or something over.

With such a sight before our eyes, and other cases very much the same, it remained questionable whether those who bought for racing purposes, to add other heavy sums for engagements, were right, and whether our estimation of the importance of the subject was exaggerated, or the reverse.

The colt was called, after purchase, Greenfinch, and while biding our time for the report of his after-progress, we happened to be in Tattersall's yard on another and later day, when up came Goldfinch, the full brother to Greenfinch of the previous year, and which colt had also fetched an extraordinary high price, and had been heavily engaged. On the second appearance at the hammer, however, Goldfinch fetched 35 guineas, and of Greenfinch we never heard anything more; therefore, we held to the opinion already arrived at, after careful consideration, that goitre in foals is to be looked on as a sign of some constitutional anomaly, the true character of which has not yet been fully ascertained or investigated.

PERISCOPE.

THE BREEDING AND MANAGEMENT OF PIGS.

(*From the Farmers' Club Journal.*)

THE monthly meeting of the Farmers' Club took place on Monday evening, March 6, at the temporary Club-rooms, Robert Street, Adelphi, London. The subject was "The Breeding and Management of Pigs," introduced by Mr S. G. Stearn, of Brandeston, Wickham Market. On the table there was an excellent model of Mr Stearn's own piggery, which attracted great interest; and plans on paper were also distributed.

The CHAIRMAN, Mr Robert Leeds, said the subject for consideration that evening was a very practical one, and would be introduced by a practical man. Mr Stearn was as well-known in connection with the local and national shows for his breed of pigs as Mr Booth had become for his Shorthorns or Mr Webb for his Downs. A few years ago the breeder who had achieved great success was anxious to keep his system of breeding secret; but those times had passed by, and farmers now met together, like other people, to talk over business matters for mutual information and advantage. (Hear, hear.) Mr Stearn was about to tell them, as he understood, not so much what he had done—that they knew already—as how he had done it, how he had raised these wonderfully precocious pigs to such a state of perfection, and had made them pay, not only in the show-yard, but also on the farm.

Mr STEARN said—Mr Chairman and gentlemen, in bringing forward the subject for discussion this evening, as it stands upon the card, viz., "The Breeding and Management of Pigs," I will explain, as far as I can, the importance of this much neglected and almost despised subject. I consider it one of more importance than almost any other subject to the public at large, as all classes, from royalty to the peasant, are interested in it. There certainly has been a great improvement in the last few years in swine, owing, I have no doubt, in a great measure to the agricultural shows having given to breeders a chance of seeing what a pig ought to be. Still there is not so much encouragement given at the shows to the pig class as there is to all other classes. For instance, Newcastle and Lynn gave away in local prizes last summer several hundred pounds to horses, cattle, and sheep, but entirely omitted the pigs; from what cause I never could make out, unless it was that they thought a pig beneath their notice. The pig is an animal of great importance in an economical point of view, if we take into consideration with what extraordinary quickness the supply can be replenished; for the fecundity of the sow is astonishing, and the early maturity of her progeny is almost unexampled in animal creation. The inhabitants of most countries are great consumers of the flesh of the pig; and no other animal produces such a variety of dishes. I consider that pork must be the most profitable article to the butcher as well as to the farmer, the offal being so small compared with either cattle or sheep. In fact, there is scarcely any part of the pig but what can be used for food; and the flesh, in the form of fresh or pickled pork, hams, bacon, sausages, pork-pies, and innumerable other dishes, constitutes the principal food of thousands all over the world. It is my firm belief that the keeping of swine is fast becoming something more than a mere means of disposing of the refuse of the farm, which would otherwise be wasted. Formerly large breeders and graziers thought the pig beneath their notice; but I find the thing is changing; still I must say I am often disgusted as well as surprised to see what a disgraceful lot of pigs are kept by many of our large agriculturists as well as by the small ones, such as I am sure if kept to any great extent will ruin any one, for they eat an enormous quantity of food, and will neither grow nor fatten upon it; but if farmers generally would pay proper attention to breeding, rearing, and feeding, I believe there could be double the meat raised at little more than the present cost, and especially if they had suitable piggeries, made use of proper feeding-troughs, and selected a good herdsman. I have studied the management of pigs for the last thirty years, and have found that the better the attention the greater the profit; and if a person wishes to make a pig pay, the pig must be kept well when young, and not allowed to run twelve months in almost a starving condition. The first thing which I introduce must be the piggeries; for any one commencing the breeding of pigs must provide a place to keep them in. I must say I scarcely ever see one that I consider fit to put a pig into. Some are badly ventilated, others low and damp, nine-tenths of them too small, some too cold, others too much confined, and having no means of

altering them between summer and winter; and a great many of them have the cisterns inside them, to receive the wash, &c., from the house, which is very bad indeed; for the constant stench from it injures the health of the animals, and I am sure is most unpleasant to those who have to attend them. But the worst of all sties are those with wooden floors laid over a pit. Some I observe a foot deep, which, of course, must get filled up with unwholesome rubbish. I have said that I am surprised at the pigs kept by many persons; but if I think again I do not know that I ought to wonder so very much, when I take into consideration the general construction of the places where the pigs are kept. If there is one corner on the premises worse than another, that is where the pig-sty is placed, and people almost require marsh-boots to get to it. There is no question but what it would be a great boon to the tenant farmer if landlords would take more interest in providing better buildings for the pigs. It is not the most expensive place that is the best; I consider it decidedly otherwise. But what is required is a simple, economical, well-situated, and well-planned piggery. Some build expensive brick or stone buildings, which I have proved are not so healthy as buildings of another kind. I find a boarded building by far the best; if tiled or slated it should be reeded and plastered underneath, so as to prevent the extremes of heat and cold, having a ventilator on the top made to open and shut, half-doors and falls both back and front, like a model of one of my buildings which I have with me this evening, and which, gentlemen, I will exhibit to you at the close of my paper. The farrowing pen ought to be large, to allow the sow plenty of room, and likewise to admit of rails being placed round the sides, and so fixed as to prevent the sow lying on the young ones. These rails should be made to shift according to the size of the sow, in height from eight to twelve inches, and extend out from the wall about nine inches, having the supports carried up sloping from the rail to the wall, instead of straight from the floor, like an inverted bracket. I will introduce a model of these rails presently. When the sow lies down there will be no likelihood of her crushing the pigs against the side, as there is plenty of space left for them to pass between her and the wall; for that is generally where the mischief is done, as sows invariably like to lean against something when they lie down, especially when they are kept bare of litter, as I like to have them. Since using these farrowing rails, I have had hundreds of pigs without losing one from being crushed; whilst if we take an average of the country, nearly half the pigs are lost from that cause. I have heard a great many people lately complain of losing many pigs from the mother lying on them; but if they will follow my plan they will find it a great protection. Each pen ought to be at least from eight to twelve feet square, and the best floor I find is asphalt. No damp or scent can rise from that. I have tried boards, bricks, and almost everything in the way of floors. Many people will contend that boards must be best; but, gentlemen, I think I can convince you to the contrary. If you will consider for only one minute, you will see that they cannot be healthy; for if the boards are placed close, you will find the moisture stands, and the floor becomes quite saturated, and if a space is left the refuse litter will go between, so that it will become one mass of putrid matter underneath, quite level with the floor, whatever the depth may be; and this is likely to bring on all kinds of disease. In the cold weather I think the asphalt too cold for very young pigs, therefore I have false lattice floors to lay down on the asphalt, which are taken up once a week, and everything is swept from underneath. Every morning I have the beds attended to and fresh littered, for I find the cleaner a place is kept the better the pigs thrive. The floors are washed down generally once a week; everything runs off, and the asphalt soon dries. There is another great advantage, namely, that it certainly does not take more than two-thirds of the straw which is required for any other floor; for the moisture appears to run under the litter without wetting it so much, as the asphalt is laid a little on the slope. What litter is taken from the pens inside serves for the pounds outside, which ought to be paved in some way to prevent the pigs from rooting. A tank should be made just outside to receive the drainage from the pounds; the building to be troughed to take off the rain-water, so as to prevent the manure being washed. By following this plan, the manure is made very regularly and good. I find this piggery most comfortable and convenient in the summer for getting pigs up for the shows. For on the hottest day it is always made cool and sweet inside by closing the top doors, opening the lower, and partly shutting down the falls on the south side, whilst on the north side everything is set open. Lattice slips are put to all the lower doors, to prevent the pigs getting out. At the time when the pigs were perfectly cool in this model piggery, the herdsman was obliged to go round several times in the day to all the other places with a watering-pot, to pour water over the pigs to keep them alive. Now, gentlemen, I think I have said enough about the con-

struction of piggeries. In selecting pigs for breeding great attention should be given to choosing a good breed, such as will come to early maturity; for that is where I find the profit is gained, and the better the quality of the breed the less food is required to bring them to that maturity. The contrast between the coarse and the many beautiful specimens of our improved breeds is very manifest, and affords good proof of what may be achieved by the skill and care of the breeder. To give an extended outline or description of the original species, or of the various breeds and innumerable crosses and varieties of pigs, would occupy too much time—therefore, I shall just describe our Suffolk pigs. From the many prizes awarded to them from the various agricultural shows all over the kingdom, and my own experience, I consider no other breeds so well adapted to most localities as the improved white and black Suffolks. The improvement took place not before it was needed, for a worse animal could not be found than the old Suffolk pig, with its long thin snout, large lapears, arched back, long legs, thin body, coarse bristly hair, thick, long, straight tail; in fact, with everything to make it a disgusting-looking brute. When I read a paper on swine a few years since, as many persons no doubt will remember, I said I did not like black pigs so well as white; but by judicious crossing they have become so nearly equal to the white that I now have scarcely a preference. They are similar in form and symmetry, and will either of them come to early maturity, and fatten to a great weight with a small quantity of food in proportion to that weight. In choosing the boar and the sow of the Suffolk breed, the chief points are: a rather small head, with wide heavy chaps; short snout; broad deep chest; ears rather small and thin, with the ends sharp and pendulous, pointing a little forward; roundness of rib; shortness of the legs; small feet; long body; the thigh well dropped close to the hock; shoulders and hams thick; the neck rising well behind the ears; small bones in proportion to the flesh; broad and straight or slightly rising back; tail small and curled, and placed high; hair thin, long, fine and silky. Strict attention to these points in selection cannot fail of perpetuating good stock. As much or more attention ought to be given to the boar as to the sow; for I find the progeny generally resembles the boar more than the sow. I prefer the sows for breeding to be rather larger than the boar, and good-sized animals, since they are more likely to have a larger number of pigs. And great care should be taken not to save one with less than ten or twelve paps. I consider twelve good even pigs to be sufficient in a general way for a sow to bring up. I do not recommend breeding very young. Generally speaking, there is not sufficient care taken on this point. Breeding too young is a means of preventing the sows growing to the proper size, or acquiring sufficient strength. The proper time for the sow to begin to breed is from ten to twelve months old, the boar being from eight to twelve months old. I think it well to cross as far distant as possible occasionally, so as to strengthen the constitution. Some think this of no consequence, and breed in-and-in many years following. Some time back I purchased a sow from a gentleman who had made a practice of this for more than twenty years. The first farrow she produced with me came out full of ulcers; the legs of most of them were crooked with large spavins; in fact, they could scarcely be called pigs at all, and I was obliged to have them all killed when they were a few weeks old. But when wishing to make a cross, my plan is to buy a sow of different blood, and then fall back again to my original stock; by which means I retain the same character, without injuring the breed. I find that by this method I can breed them almost exactly as I desire. So far as my experience goes, the time of gestation averages about 113 days, or sixteen weeks and one day. But old sows go rather longer than young ones. When a sow is in pig she should have full liberty to roam about and feed on grass in the summer, whilst in the winter she should have roots of various kinds and about a pint of beans per day. A short time before farrowing she ought to be put into a convenient pen or sty, and fed on simple food. As the time approaches she should be carefully watched, and allowed only a small quantity of dry short straw; otherwise, on farrowing, if the straw is too long, the pigs are very likely to be smothered. The proper plan is, at the time of farrowing, to have a man with the sow to attend to her; for I think it is not wise to lose half, or perhaps the whole, of the pigs for the want of a little attention at the most particular time, especially after having had the expense of keeping the sow so long previously. At the time of farrowing I allow a very small quantity of litter cut short, and have a hamper placed in the pen, with a little straw at the bottom, and lined with an old blanket. I put a slip or partition about two and a half feet high across the pen, to prevent the sow from getting to the hamper. As the pigs come forth, I put them into it, and cover them up, until the sow has done farrowing, after which I put them to her and let them suck. When finished I put them back into the

hamper, give the sow a little warm milk and bran, and whilst she is eating this have the bed attended to, by removing all the wet straw, &c. I add a little fresh straw cut short, and then, when the sow lies down, let the pigs go to her again. I always give the herdsman sixpence per head for all the pigs he can bring up to a month old. I find this much the cheapest plan, for then there is no fear but that he will see to them properly, and attend to them in the first instance as well in the night as the day. How often do we hear people complain of the sow eating her own young? Therefore steps ought to be taken to prevent her from doing so; for, when once a sow does that, she is of very little use for breeding purposes. If you will allow me, I will explain what I have found to be the cause. In some litters the side-teeth are much longer and sharper than in others; when this is the case, and the pigs begin to suck, they bite and scratch the paps, punishing and irritating the sow to such a degree, that it brings on inflammation, and the sow becomes mad with rage. She throws some one way and some another; at last she bites them, and, if she once draws blood, she will begin to eat them. Now, my plan for preventing this is as follows:—When the pigs are a few hours old I have them taken away in the hamper, so that the sow cannot hear them, and nip those teeth off with a pair of pincers. As soon as this is done, and the pigs put back, the sow is as kind to them as possible, and perfectly docile. Since having my model piggery, I prefer breeding in the winter, rather than in the summer; for the proper temperature of the building can be kept up quite sufficiently in the coldest weather, and after the pigs have been taken proper care of the first day or night, the cold does not appear to affect them so much as the heat. If pigs are farrowed in January and February, and kept with the sow eight or nine weeks before being weaned, they will grow and thrive in the spring and summer, so that they are fit for either breeding, feeding, bullock yards, or any thing you may require them for in the autumn, and thus you can have another litter of pigs in August instead of October. When farrowed too late in the autumn, young pigs will not thrive through the severe weather in winter; and especially if the usual plan is resorted to, of turning them into open sheds or cold piggeries, you see them worth very little more for their two or three months' keep; but by pursuing the plan I have recommended, you clear the worst time by having the pigs kept with the sow. The general opinion is, not to breed, so that the pigs come at the time of year I have stated, viz., January and February, because people care to give so little attention to the sow at the time of farrowing. She is put into a cold damp sty, with scarcely room to turn round in, and a great deal of straw. When she begins to make her bed, strict orders are given to the man or boy not to go near her for several hours, for fear of disturbing her; but when he does go to the place, he finds that some of the pigs have crept away from the mother, and perished with the cold, and some are crushed against the wall for want of rails to protect them. Some sows, especially young ones, will not allow their pigs to approach them; others will eat the pigs in consequence of their paps being so bitten and punished by the teeth. Through all this mismanagement many gentlemen have declined breeding pigs altogether. I find eight weeks old is a good time for weaning pigs in the summer, and nine weeks in the winter. And I like to have those which are not saved for stock operated upon a short time previously. The boars I keep for stock are confined in a shed with a roomy yard, under lock and key; for if they are allowed to roam, we are likely to get wrong in the breed. I allow them plenty of water, and about a pint and a-half of beans each per day, and any other food which is most convenient, such as vetches or mangel-wurzel: I always keep some of the latter all the year on purpose. I will now explain my method of feeding. Many people think I have said too much already upon that subject for my own interest; but never mind, I have no secret. When the pigs are about three days old, and whilst the sow is feeding, I give them some new milk, warm from the cow, sweetened with a little sugar, just to induce them to eat. The milk is put into a flat wooden trough, with the sides about three-quarters of an inch high, placed in the bed where the pigs lie. After running into it once or twice, they will drink it, and are no more trouble. In three or four days I mix half skim milk with the new, and likewise some oatmeal and a little fine sharps; by degrees I omit the new milk and sugar, and in their stead add some whole Indian corn or barley. The sow, as I have stated before, after farrowing, should be fed for a few days on mild food, such as bran mixed with warm milk. After two or three days add a little barley or bean-meal, and increase the quantity of these as the pigs keep growing. For a few weeks after the pigs are taken off the sow, they cannot be fed too well or too frequently; but care must be taken not to give them too much food at a time, and to make them clear their troughs out, for they will eat the food much better when it is fresh. I give them a

variety of meal, such as wheat, maize, barley, oat, and whatever is most convenient to mix together. I have it all wetted with cold water, and then scald it with boiling water, and sprinkle it with salt. The cooking house is fitted up with a copper and cisterns, and the food is mixed one under the other. What is mixed one day is used the next, thus giving sufficient time to allow the food slightly to ferment, and cool sufficiently to feed with. This is my winter plan, but in the summer I mix all with cold water, and feed with cold food. Between meals I give them whole maize, and mangel-wurzel or swedes cut small, a little coal and soil occasionally, and allow them plenty of clean water. When pigs are put up fatting, I find nothing better to feed them with than barley and maize meal, mixed together into slops, water always kept by them, and a little mangel cut for them occasionally. It is very beneficial to wash and brush them as often as convenient. This is quickly done by experienced hands, and will amply repay for the trouble. If you will try the experiment between this and the common mode of treatment, you will be surprised at the difference. I am certain that the cottagers would find their pigs fatten a great deal faster if they would wash and brush them, and feed them with warm food, instead of with food all ice, and that they would be well paid for any little extra trouble it might cause them. Store pigs ought to have their liberty, as far as convenient, to range in large yards in winter, and to have the run of a piece of pasture in the summer. They should also be fed two or three times a day. Good-bred and well-fed store pigs will always consume the refuse from the farm and dairy, which a bad-bred one would refuse. I have never known mine refuse anything in the way of pig-food yet that was offered them, not even the prize animals. I have received letters from a great many gentlemen at different times, requesting me, if I could, to inform them how to prevent little pigs' tails falling off. Now this is a thing I have given my attention to for a long time, but I am sorry to say up to the present I have not been able to solve the mystery. I have asked the opinion of a great many old pig-breeders, but no two thought alike. One would have it that it is only the winter pigs which lose their tails; another says that it comes from the easterly winds; another, from breeding too close; another, from feeding. I have bred thousands of pigs, and tried a great many experiments. Once or twice I thought I had found out the riddle. But no; what seemed to do good at one time took not the least effect the next. I find that quite as many pigs lose their tails in the spring and summer as in the winter. I have bred as closely as anything could be bred, just for a trial, and not one tail has come off. Then, again, I have bred as far distant as possible, and perhaps nearly half the pigs have lost their tails. Sometime last summer I had two sows, sisters of one litter, put into a place with only a low partition to divide them. They farrowed within an hour of one another. Several pigs of one sow lost their tails, whilst those of the other lost none. Both litters were bred precisely the same. In the coldest week last January five of my sows farrowed; they averaged ten pigs each, and not one of them lost a tail. I have quite made up my mind it is neither breeding, feeding, hot weather, cold weather, nor easterly wind which is the cause, nor does it signify whether the pigs are black or white; therefore I must leave it to some one with a wiser head than I have to solve this mysterious affair. I will now introduce feeding-troughs. This is a subject which I consider has been but little studied, if we may judge from the badly-constructed troughs we see in use. Not being able to buy, or even see, a trough my short-legged heavy-faced pigs could eat out of at all comfortably, I turned my attention to them, and designed some, which have been manufactured by Messrs Ransomes and Sims, Ipswich. They are of simple construction, easily adjusted so as to suit pigs of various sizes, and will prevent waste and soiling of food; are a good width from back to front, and have no sharp edge left in the front, so that a pig with the heaviest chap can feed with the greatest ease and comfort, as well as those animals that can eat out of a quart mug. In fact, they are most economical in every respect. I have brought models with me; but as the troughs have been out some little time, I think most likely many now present have seen them in use. I will offer nothing further, except my best thanks, gentlemen, for your kind attention. My statements are plain, and I hope intelligible. If they appear too plain for my present audience, they I trust will be good enough to accept an apology on the ground of my anxiety that every person, however unlettered, may be able to understand and apply them.

Mr Fisher Hobbs (Boxted Lodge, Colchester) said, as an old pig-breeder, they perhaps expected him to make a few remarks. He had not, indeed, come prepared to make any, and should therefore merely refer to the points to which his friend Mr Stearn had alluded. In the first place, he would observe that Mr Stearn made a slight allusion to persons who having been exhibitors of pigs many years ago, did not come

before the public in that capacity now. Perhaps he intended to refer to him (Mr Fisher Hobbs) as having been an old pig-breeder, and as not being so successful as he was years back; those who knew his breed of pigs, and who had seen them of late years, would, he thought, admit that they were better now than they ever were before. His reason for withdrawing from exhibitions was well known to many. That reason was, that he had taken an active part in the Royal Agricultural Society as steward and as judge, and especially in the former capacity; and it was hinted to him by some person that he had better give up that position or the position of an exhibitor. Of course, after a number of years every one got tired of exhibiting; but he still kept his breed of pigs, which was originally descended from three families. For upwards of five-and-twenty years he had never gone away from his own breed, either for a boar or a sow, and he contended that by judicious selection of both the male animal and the female the breed might be perpetuated in that way. Of course, this system required a considerable number of animals, and a very choice selection of the male for the female. He concurred in most of the remarks that had fallen from Mr Stearn, but would have liked to see the paper turn more on the breeding of pigs. He was very glad that Mr Stearn had come to what he considered a right conclusion on that subject, namely, that they should select their pigs according to the climate and the management to which they would be subjected. He knew that a few years ago his friend set forth to the world that all breeders of black pigs were in the wrong, and that there would soon be no pigs but white ones. Now, he (Mr Fisher Hobbs) contended that in a hot climate like the eastern counties of England, where pigs were during the summer months turned out to grass and clover, black skins were favourable to animals, as they did not attract the heat so much as white skins. Not long ago the black pig would have been hunted down in Suffolk, quite as much as a wolf would be at the present time; but he was glad to find that in that county black pigs were now almost as common as white ones. He would appeal to Mr Stearn whether that were not the case.

Mr Stearn.—No.

Mr Fisher Hobbs.—Well at all events, he had made a very considerable advance in the last twenty years—(hear, hear)—and hence he thought agriculturists must have become aware that animals should be selected in accordance with such requirements as he had referred to. In the South of England also black pigs were almost universally selected, especially in Kent and Sussex, and they extended as far as Devonshire and Cornwall. Mr Stearn had laid down certain rules in regard to the selection of animals, and they were rules which must commend themselves to all breeders. As regards the complaint that the Royal Agricultural Society did not offer any special prizes for pigs, he would observe that when that question had come before the Council he had abstained from taking part in the discussion, because he knew that the feeling of exhibitors was so strong that they might have supposed he was influenced by his own position; but now that Mr Stearn had introduced the subject, he must say that he thought that in most societies the pig had not hitherto occupied its fair position. As to early maturity, small offal, and so on—those were points on which they were all agreed. He did not agree with Mr Stearn that asphalt made the best floor for the pig or for any animal. It was exceedingly cold, and was so slippery that although plenty of litter might be placed upon it, it was very apt to slide away, and many injuries had taken place in consequence. Many years ago he was very partial to asphalt floors, both for pigs and for cattle; but he had broken them all up. He believed that good hard concrete, made with one bushel of lime and six bushels of gravel, a few hard cinders, well pulverized, and perhaps a little chalk, would form the best kind of floor, and it was very inexpensive. He had had floors paved with hard white bricks, and in various other ways; but he had found that concrete, when kept sufficiently clean, made as hard and good a floor as they could have. Certainly, when not well made such a floor was apt to get loose, and water softened it; but when thoroughly made, it was as hard as a board, and no boar could put his nose into it—an evil which it was sometimes very difficult to obviate. With regard to the buildings recommended by Mr Stearn, he (Mr Fisher Hobbs) considered them simple and economical, and when a man had to build a new piggery on a small scale, he could not perhaps lay out his money better than by erecting it in that form. There were, however, two points which it was very material to bear in mind: one was, that a piggery should never face the north; the other was, that they should never use red bricks in building it, as bricks of that kind absorbed moisture and interfered with the health of pigs. One great feature in the internal arrangements of Mr Stearn's piggery was the wooden rail, which prevented the sow from injuring her young. If there were nothing else

that entitled him to them, Mr Stearn would deserve the thanks of pig breeders for exhibiting that excellent arrangement. As regarded parturition, there was one point mentioned by Mr Stearn, which had certainly not been sufficiently attended to: he meant the proper amount of litter. He said that, in littering, breeders were very apt to give the animals too much straw, and that a good number of pigs were lost from that cause, a statement that he (Mr Fisher Hobbs) could fully confirm. With respect to the evil of sows eating a portion of their young, he must say that when a sow had become carnivorous, perhaps from having been in a butcher's yard, or eating portions of dead game or poultry thrown into the pig-yard, he did not see how the thing was to be stopped. But the evil was too frequently brought on through the sows being in a feverish state, partly in consequence of irritation caused by the young pigs. He believed it was generally brought on by the milk's being inflamed, in consequence of the sows having eaten such fattening food as barley-meal beforehand, instead of milk-producing food. He considered that that frequently conduced to make the animal carnivorous as much as the irritation from the teeth of the young pigs. With regard to these black pigs being called Improved Suffolks, he could never understand why the Suffolk breeders claimed any priority in that respect. He had himself sent pigs into Devonshire, Oxfordshire, and other counties. He recollected sending, a few years ago, a boar and a sow into Oxfordshire. In the first year the produce came out as a half-breed—improved Essex and Oxford; in the next year as an improved Oxford—(laughter)—and so the change went on. Although they were the same animals in form and character, they lost the appellation of Improved Essex, and jumped into a new one. When he first bred pigs, he selected three animals which originally descended from Lord Western's. He had the Neapolitans, and with them he crossed the Old Essex, which was formerly a black-and-white pig, very little better than the unimproved breed which Mr Stearn exhibited now; but in course of time he got it all right. Having the privilege of sending his sows to Lord Western's boar, he used to send animals similar in colour to his lordship's own, but larger; and Lord Western used to exclaim, "Why, whatever did Mr Hobbs send that brute here for!" His object was to get a male animal which was erect in form, and at the same time a good female with plenty of room for young. From those three families he contrived to form one breed; and for five-and-twenty years he had never used either a male or a female belonging to any one else. He did not mean to say that, if he did not sell one particular breed of animals, he would be right in keeping solely to that stock; but there were many persons, both at home and abroad, who looked to him for a good boar. His friend Mr Stearn had got hold of the Improved Essex, and called it an Improved Suffolk. Perhaps they would some day have a little race together—(hear, hear)—and then it would be seen which breed was the best. At all events, he thought a long race of pure blood must be very beneficial, crossed with other breeds; and his main reason for pursuing the course he had done was that he knew other persons liked to have a thorough-bred male animal. Mr Stearn threw out a sort of challenge about pigs' tails. He had his own opinion on that subject, and he held that, on two out of the three points which he mentioned, Mr Stearn was correct. In the first place, he agreed with his friend that by high breeding pigs would lose their tails, if they were not properly attended to—that was to say, pigs were very subject to the influence of weather, and many of them were lost through not being kept sufficiently warm. When pigs were high bred, coarse wheat-straw was often very prejudicial. If straw was of very flinty character, it irritated the skin; and the tail was, in consequence, more likely to break off. Some years ago the late Lord Western had a particularly good boar which had lost its tail. He asked his lordship why he was breeding from a pig without a tail. He only laughed at the question; but in three years he had scarcely a pig throughout his herd with a tail, and that showed what was likely to follow where there was breeding in-and-in, by injudicious selection. But the question was, why pigs lost their tails? He believed it was partly in consequence of the parts being so small that the blood could not freely circulate in cold weather. He recollected having formerly lost far more pigs' tails in winter than in summer, but he had latterly avoided that source of loss to a considerable extent. But he thought this evil was attributable, in a great measure, to breeding in-and-in too much, without a proper selection of the male animal. As regarded the troughs which Mr Stearn recommended, he begged to say that he had used them himself for the last three years, and he considered them invaluable as regarded economy of food, and in every way. In conclusion, he would observe that he believed that pigs, if properly managed, would, quite independently of prizes, prove profitable animals, eating, as they did, the refuse of the farm, and not requiring much expensive food. He knew that in

Norfolk, and some other counties, many of the best graziers hated the sight of a pig; but he thought that at the present time, with economical and well-arranged buildings and judicious management, the quantity of pigs might in many cases be increased to a considerable extent with advantage. He knew that at the exhibitions abroad foreigners had all the English improved breeds. Especially was that the case in France, and in that country pigs were now managed so well, that if a challenge were given by England to France for a show of pigs in 1867, he would rather back the French than the English, even with the English breeds. (Hear, hear.) Therefore, he would advise Mr Stearn, if he intended to continue an exhibitor, to look about him, and keep up his breed. He would be happy to answer any questions which his friend might put to him, or to show him his pigs, and although he was not an exhibitor at present, he might be enticed by a challenge to come out as an exhibitor again. (Cheers.)

Mr L. A. Coussmaker (Westwood, Guildford) said—Mr Fisher Hobbs had made some remarks about the colour of pigs, to which he wished for a moment to allude. It was an old saying that there never was a good horse of a bad colour; and perhaps that remark was applicable also to pigs. Mr Hobbs seemed to think that black pigs were better adapted for the south of England than white ones. Now, unless he were mistaken, it had always been considered that black attracted the sun's rays more than white. (Hear, hear.) They painted their gates white to protect them from the sun; they wore white hats to protect their heads from the sun; and they painted their garden walls black to attract the sun. He understood Mr Hobbs to say that black pigs were better adapted for the south than white ones. He should have thought that the reverse was the case, seeing that black attracted the rays of the sun, and retained heat much longer than white.

Mr G. M. Allender (Lee Grange, Winslow) said—Some years ago he heard Mr Stearn deliver a lecture, somewhat similar to that which he had given that evening, before a local society in Suffolk, and he then picked up a good many wrinkles from him, and had kept them. (Laughter.) He thought that gentleman was perfectly justified in what he had said about the neglect of pigs by the Royal Agricultural Society. Speaking generally, he must say that pig breeders had not been at all well treated as regarded prizes. It cost quite as much to take a pen of three pigs to a show as it did to take a pen of Southdowns; yet, while the owner of the latter might get £20, the owner of the former could only obtain £10. That was, of course, merely the pounds, shillings, and pence view of the matter; but still the difference had its effects as regarded breeds of pigs. Respecting the management of breeding-pigs, he perfectly agreed with Mr Stearn, that rails round the farrowing pen were a most valuable protection. Two or three years ago he adopted Mr Stearn's plan in that respect, and since that time he had not, he thought, lost a single pig. On the previous day he found quite unexpectedly a large litter. Not one of them was crushed; whereas, without the rails he would probably have lost half. Many persons bred far too early from young sows. Last year he sold to a gentleman in his neighbourhood a young pig, warning him against breeding too early. This advice was disregarded; the purchaser of the pig commenced breeding when she was eight and a half months old, and the result was that out of the first litter, consisting of eleven pigs, only two were left. He was at issue with Mr Stearn as regarded the merits of Berkshire pigs. There was one breed of pigs to which three parties were laying claim for their respective counties, Mr Stearn claiming them as Suffolks, Mr Hobbs as Essex, and some one to whom Mr Hobbs alluded as Oxfords. Now, Berkshire pigs were Berkshires all the world over—(hear, hear)—in whatever county they were bred they were well received, and one great merit was that they yielded more lean flesh in proportion to the bulk than any other class of pigs. (Hear, hear.) The cooking of food was often very useful; but care should be taken not to supply food in too warm a state, as in that case it was apt to affect the lungs. With regard to the best food for pigs, he would observe that when questioned on that point last week he replied, barley-meal. As to the losing of the tail, he supposed that was confined to the Suffolks; he had not found the Berkshire pigs losing their tails. (Laughter.) Personally he felt very much obliged to Mr Stearn for his paper. Although pigs were generally put down last in show lists, it should be recollected that they were the animals which produced the largest amount of meat within a short time. (Hear, hear.) A litter, say of ten pigs, could be converted into a ton of meat in six months, with ordinary good feeding. There was no animal in creation that would yield such a return, and therefore he thought neither the Norfolk graziers nor any other graziers ought to turn up their noses at pigs. (Hear, hear.) Before sitting down he would remark that in his neighbourhood there was a disease among pigs, which was a sort of fever, and was so

serious in its effects that some persons had lost from a hundred to a hundred and fifty pigs within the last twelve months. He lived near Aylesbury, and there many farmers had given up keeping pigs because they had not been able to get rid of this disease. They had gone into the market, bought a lot of pigs, and within three or four days had lost them. [A VOICE: What are the symptoms?] The animal was at first a little drowsy and off its feed. A few red spots were afterwards found, principally about the belly. The redness sometimes extended to the intestines, and the whole body became red. Animals attacked with this disease had been killed in thousands during the last year.

Mr T. OWEN (Clapton, Hungerford) said—Being a Berkshire man, he rose to confirm what had just been said with respect to the Berkshire breed of pigs. Having bred and fed a great many of them, he contended that they were the most useful pigs in the world, inasmuch as they made more lean in proportion to the fat than any other kind of pigs, and were always in favour both with the butcher and the consumer. In his neighbourhood, a pig that weighed above ten score could not be sold without great difficulty. One great advantage of the Berkshire pig was that it could be fattened very quickly. The butcher or the bacon-curer who came into his district would always prevent the breeders from fattening their animals too much. Animals weighing from seven to eleven scores could be sold very readily; but if farmers carried pigs beyond eleven scores, they had to look a long time for a customer. He quite agreed with Mr Stearn, that the piggery which he had described was a very nice one, adapted to bring a pig to perfection; but he contended that it would not do in his own neighbourhood to breed and feed as Mr Stearn did, and for this reason, that there were no breeders who cared about the fineness of their pigs. They went into the market, as feeders, of pigs, to buy the most hardy animals they could obtain; not animals which had been pampered, but such as had been fed moderately; and he believed that there were ten times as many customers for pigs of the former as for pigs of the latter class. He agreed with Mr Stearn that, in order that a pig might be brought to perfection early and for show, it should be kept on as long as possible with sugar, warm milk, and things of that kind. He had himself fed three or four hundred pigs a year in accordance with the views which he had expressed. He once obtained a lot of Chinese pigs, and they fed so exceedingly fast that he thought he had got a complete nest-egg on his farm; but the result was, that when he sent them to his butcher in London, whom he sent all his porkers to, he returned a few chops out of one of them, and desired I should cook them. They were all fat, no lean, and said he could not sell them at any price. In his (the butcher's) opinion, there was no pig in the world equal to the Berkshire pig, because it yielded a greater proportion of lean to fat than any other breed. With regard to what Mr Stearn said about the breeding of sows, he would remark that, in his (Mr Owen's) district they never liked their pigs to farrow early, or in winter. They generally endeavoured to get sows to farrow not earlier than the first week in March. Then he kept the little pigs as growing as possible. At the end of seven weeks they weaned them. They then placed the sow for a few days where she was certain to go to hog (they had the boar always at hand;) and they always found at the change, when the milk was going away, that she was sure to take the boar, so that they had a second litter, generally at the commencement of August. These pigs required very little care—at least, not half the care that they would require if they were farrowed in January; and, as Mr Hobbs had justly observed, the finer an animal is bred, and the purer its blood, the more liable it is to a weakness in the tail. A rough pig out of a litter will not, in Berkshire, lose its tail; but he considered the frost had much to do with it. When exposed to a severe frost, he had seen as many as five or six out of a litter lose their tails. He quite agreed with Mr Stearn that for pigs, in the summer, pasture-land was the finest thing, for nothing was so good for them as gnawing the turf. The plan of Mr Stearn was not carried out in their neighbourhood, for this reason—namely, that landlords, as a rule, did not like to see an expensive building of that sort: they were sure to say it was too fine, or something of that kind. The last speaker had referred to the diseases of pigs. He had seen a lot of twenty bought at Newbury market; and within a week, three parts of them had died: and he quite agreed with that gentleman in saying they could discover nothing indicative of disease but a small red spot. If they killed a pig in good condition, but diseased, and scalded it, they would see red spots upon it. It would be quite white when scalded; but when it cooled down, it became a perfect pink along the belly and sides. He had had several in that state; and though he had consulted a veterinary surgeon, that gentleman could never discover a remedy. He said that the only thing to be done was to remove them, and thoroughly whitewash the sties

with quick-lime, and, in fact, make a clearance, and get rid of the lot, because the disease, whatever it was, was very infectious, and he had never yet seen or heard of its being cured.

Mr Robert Smith, (Emmett's Grange, South Molton,) would not have risen but for the observations which had been made with respect to the Royal Agricultural Society of England. Being intimately connected with that society, he wished to set one matter right. He happened to be a member of the Prize-sheet Committee; and the first object of that committee was to agree on the amount to be devoted to that prize-sheet, and then they proceeded to allot that amount in various proportions amongst the several breeds of animals throughout the kingdom. Of course, their first object was to encourage cattle; next, sheep; thirdly, horses; and lastly, if they pleased, pigs. Turning now to the question of the management of pigs, it was many years since he had taken any part in that business; but he thought they would agree with him that there were some conclusions at which they had that night certainly arrived. First, they had arrived at the conclusion that they had a most excellent advertisement before them; next that pig-breeding seemed to be quite a profession; next, that good diet and warmth were two great essentials towards early maturity.

A Member.—And cleanliness a third essential. (Hear.)

Mr Smith.—And a fourth, if you please,—"they clip no wool." (Laughter.) Another matter had been stoutly debated, but on that they had not arrived at a conclusion; he referred to the pig's tail. (A laugh). Some gentlemen said that it dropped off at one age, some at another; some that all lost their tails at one time or another; and that Berkshire pigs alone seemed to retain them. But whether they kept them on or dropped them off, his (Mr Smith's) experience in the breeding of pigs was this, that if a sow farrowed in warm weather, the pigs would not be troubled with tail-disease, while if she farrowed in cold weather they might be. Now he would suggest that if they pinched off a little bit from the end of the tail and thus caused the blood to circulate, the tails would remain on. Mr Hobbs had referred to pigs in Devonshire, and that was a part of the country with which he (Mr Smith) was well acquainted. It was a notorious fact that the best farmers in the west of England had an opinion that white pigs burned in the sun, while black ones did not. As to the use of asphaltum as a floor for pigs to lie on, he thought that would be rather a cold affair. He himself had lately erected a piggery, and in doing so had hit upon a grooved brick, which answered remarkably well, and he had adopted Torr's patent double feeding-trough. With the latter the fat pigs fed on one side; they then lifted up the shield or slide, and the store pigs came and cleared out the trough. In some instances there was a yard attached, when the pig entered at the centre, then went in on the one hand to a raised ground of grooved bricks, with an incline towards the centre. They fed there, and went out for natural purposes to the yard, from which they went to the grooved bricks on the other side, where they lay on a raised bed. Where that plan was adopted, and they had a supply of water to wash out the grooved bricks, it was certainly the most perfect they had ever seen. He did not go altogether with Mr Mechi about feeding pigs on boards, because, as Mr Stearn had very properly said, there would always be a certain amount of stench; but within the last few days he had gone into his own piggery, and it was as sweet as they could wish a piggery to be, simply from the fact that the sewage could not remain. It was carried off by the grooved bricks on the incline; and that arrangement was as nice a one as could be imagined. A remark had fallen from Mr Stearn as to the time when pigs should be dropped. He (Mr Smith) had a particular fancy with regard to that, whether it was the pig, the horse, the cow, or the sheep. He should like the young animal to be dropped as it were not in the rising of the moon, but the rising of the year, about the 1st of January, and grow into the warm weather rather than the reverse. There was a principle involved in that, and the more they adhered to that kind of thing, keeping warmth strictly in view as nature's principal law, they would find they would not err so much as those of their neighbours who blundered along, and contrived to have their animals grow into the cold weather instead of warm. (Hear.)

Mr Wilson (Althorne, Maldon) said they were indebted greatly to Mr Stearn for the very interesting lecture which he had delivered, and for having delivered it without reserve and telling them all he knew. It was for those present to consider how far they could individually apply his experience, or how far they found their own plans more convenient to carry out owing to their being accustomed to them. There were three objects in pig breeding, and according to the particular object which the breeder had in view so he must govern his proceedings. Thus one man bred pigs in order to

get a prize, another to get store animals, and a third for the shambles; and in all three a different mode of proceeding would be necessary. He himself had found that, as a general principle, they could not feed animals too highly from the earliest time, although they might at that time be apparently unsaleable. He had never found difficulty in selling stores because they were too fresh; he had generally found it to be the reverse. With regard to various breeds, he thought every breed had some good property of its own which was appreciated by the neighbourhood where it was best known. One reason for the disease amongst pigs, which developed itself in many various forms—sometimes in the pigs being without tails, sometimes with spots on their skins, sometimes in their suffering from cramps—was that the hog was not sufficiently often changed. It matters less what hog they used, provided they changed the animal every year; for breeding in-and-in was worse with pigs than with any other animal. The man who bred carefully, and had a good hind to manage his pigs, would manage to have five farrows in two years; and that was breeding rather closely. They must not, however, be surprised if they got the blood diseased from too frequent communication. As to the cheapest food, he had generally found that to depend chiefly upon the market price. This year the great crop of barley made that the cheapest food; but last year Indian corn was by far the cheapest. The best imported food for pigs would be lentils; but the very first season of their importation, it appeared they cleared out Egypt and other countries. To-day, at market, 36s. were demanded for lentils, whereas good Indian corn could be obtained at 28s. They could not, therefore, lay down successfully any fixed rule as to the best food for pigs; but he imagined that, in proportion to the food consumed, a pig paid better generally for his keep than any other animal. He did not believe that a bullock or sheep would make anything like the large return that a pig did; and, with present prices of food, the pig will prove the best grazier. He said "grazier" because the pig was a good grazier, and made more money than anything else; pigs came to maturity more quickly in proportion to the food they consumed, and they therefore made the greatest return. There was no doubt but that the disease in pigs originated in a peculiar state of the blood; and if by the use of sulphur—only a pig was so difficult to physic—or any other medicinal preparation, they could put the blood into a right state, a pig might be as easily kept healthy as a sheep or a bullock. Unfortunately, however, they could not doctor him; and, therefore, the knife was the only cure for the disease in pigs. With regard to the question of fat, it was a common experience that it was difficult to sell, it being said that people would not eat it, and that, therefore, they must get pigs of about eight score to meet the demand. He, however, would remind his brother farmers that the fat was easily converted into lard, while they could sell the leaner parts for bacon at a fair price. So that if any of them were tied up with a large lot of fat pigs, there was a sale for them without giving them away.

The Chairman, in drawing the discussion to a close, said that they ought to feel grateful to Mr Stearn for the frank and open manner in which he had described his system of feeding. He (the Chairman) was not a pig man, but whenever he had taken it in hand he had lost money, and he believed moreover that eight out of every ten persons would find that they did the same if they kept accounts. At the commencement of his paper, Mr Stearn had remarked that farmers formerly despised pigs, but he (the Chairman) could not admit that, because when he began farming, some thirty years ago, he was obliged to keep from three to four pigs to every bullock; and his system now in stocking the yard was to keep one pig to every two or three bullocks at the most. As to the question whether they could buy pigs and keep them on corn, he should like to see the accounts of those who had tried it during the last season. He could only say that his account was a very bad one; but he had to pay his neighbour, Mr Hudson, for grinding a thousand coombs of corn, most of which they had eaten. He could not, therefore, agree with Mr Wilson.

Mr Stearn, in reply, said he quite agreed with Mr Hobbs that there were certain districts where black pigs were the best. Where there was much clover grown, black pigs might be turned into it; but looking to the average of the whole country, he would back the white ones against the black, whether in summer or winter. The heat of summer no doubt affected the white more than it did the black; but in the winter the black was more tender than the white, as the latter could bear the cold much the best. With regard to the cause of the tail disease, some persons believed it to be occasioned by the frost or by close breeding; but in January last, when there was plenty of frost and snow, he had five sows farrowed within a few days of each other, averaging ten pigs in each farrow, and not one of them lost a tail; and, on

the other hand, he had ten sows farrowed last summer about the same time, and several of the pigs lost their tails, not one of those who were bred the most closely losing theirs; but when he bought strange sows and crossed them as far distant as possible, many of the pigs lost their tails, and he could never divine from what cause. He had tried everything he could think of to check this disease; he had even cut off pieces of the tail pretty well up to the red spot itself, and even then the small portion of the tail left would drop off. As to the Berkshire breed, that was no doubt good for bacon, there being plenty of lean, but perhaps it took more time to make the pigs fat than he should like. They were, no doubt, a kind of pig more suitable for some districts than for others; and when large flitches of bacon were wanted, he would recommend the Berkshire breed. With regard to the expense of his building, he could only say that if they could erect it for £25, and it would last for a lifetime, he did not think they could require anything cheaper, seeing that it had every convenience, and was well ventilated. With regard to the floor being a smooth surface and well drained, he could, by taking the lattice floor up once a week, and sweeping everything away from under it, have the whole as clean as possible. With regard to the prizes given by the Royal Agricultural Society, no doubt it was right to fix upon a certain sum to be distributed amongst the several classes, but he would recommend as a much better plan that they should give larger sums and fewer prizes. As to the Chairman not making his pigs pay, he was not surprised at it, for a bigger lot of vermin he never saw than Norfolk pigs. He had never yet seen a good pig bred in Norfolk; they were the worst lot of pigs under the sun. He could scarcely call them pigs, and was satisfied that they would ruin any man in England who attempted to keep them, as it was impossible to make them pay.

The CHAIRMAN said that the principal part of the pigs he had kept so unfortunately were animals brought from the county of Northampton, from a gentleman who had as good pigs as any man in that county.

On the motion of Mr T. Congreve, seconded by Mr Coussmaker, a vote of thanks was passed to Mr Stearn for his excellent paper; and a similar compliment having been paid to the Chairman, on the motion of Mr R. Smith, seconded by Mr Nash, the proceedings terminated.

ECLIPSE AND TOUCHSTONE.

To the Editor of the Sporting Times.

SIR,—I beg permission to correct a mistake which found its way into the *Sporting Times* of 18th instant; where, in your reply to Sir J. B., the narrative runs thus:—"It is said that the skeleton of the famous Eclipse is in the Hunterian Museum of the Royal College of Surgeons. Mr Flower, the articulator attached to that institution, has lately mounted *Touchstone* for the Marquis of Westminster, by whom the animal was much prized."

The above reference to the skeleton of Eclipse is void of foundation; that about Touchstone is, I believe, substantially correct. It is to set the matter right about the first-named horse that I intrude on your space, and the time of your readers.

In November 1860 I became the medium of treating with the now lamented Mr Bracy Clark, the then owner, for the skeleton of the renowned Eclipse, for the New Veterinary College at Edinburgh; and I accordingly purchased the skeleton for the price of one hundred guineas, of the man whose property it had been from the latter end of the last or beginning of the present century. The purchase was effected, and Eclipse's skeleton transferred to Edinburgh, from Clark's house in London, just seventeen days previous to the occurrence of the death of the able and zealous cultivator of veterinary science, at the great age of ninety years.

Besides bringing the bones of the best horse on record out of the box in which they had been so many years secluded, we were probably, as the following incidents will show, instrumental in causing those of the next grand horse of his time to be disentombed, and placed within the reach of the student, for observation and comparison.

The facts stand thus:—Desirous to obtain the skeleton of some one of the best amongst the horses of our time, to place beside that of Eclipse, we began to make

inquiry, and turning our attention to the old animals then (1860) living, Touchstone and the mare Pocahontas stood foremost. A little time elapsed, and before any application was made the death and burial of Touchstone, which had taken place at Eaton Hall, were publicly reported.

Correspondence with the noble owner was begun by Professor John Gamgee addressing a note, soliciting permission to obtain the bones of Touchstone, for the expressly avowed purpose of placing them beside those of Eclipse. To that application a most condescending reply was written by the Marquis of Westminster, and there appeared no impediment in the way of the obtainment of our object, until further consideration determined that the grand horse's skeleton should have a place in the Metropolis. The disinterment was accordingly effected, and the bones conveyed from Cheshire to London, where, under the superintendence of Professor Flower, the skeleton was arranged and put up, to be seen with the most valuable collection of its kind in the world.

With permission, I will take this opportunity of making a few observations on the importance of preserving skeletons of very choice specimens of the horse, independently of the high value to be attached to those of the two extraordinary animals referred to.

All philosophic anatomists make profound study of skeletons, assiduously compare and often refer to them; and none have more need of adopting such course than those whose aim it is to become profoundly instructed in the construction and movements of the horse, whose worth depends on degrees of perfection in conformation, substantially governed by the physical condition of the horse's frame.

How it is that a subject of so much importance should have been so little recognised is matter of astonishment. There have been few skeletons of the horse accessible even to students, and those preserved, regardless, for the most part, of any typically high standard of perfection in the animal to whom they belonged. The best horses, Eclipse excepted, have been buried, which, in reality, amounts to burying the indexes to knowledge.—I am, sir, your obedient servant,

JOSEPH GAMGEE.

NEW VETERINARY COLLEGE,
Edinburgh, Feb. 21, 1865.

[We were aware when we wrote the reply to Sir J. B. that Mr Gamgee had a skeleton which was reputed to be Eclipse's. But it is just possible that neither the one in the Museum of our Royal College, nor the one in Mr Gamgee's College at Edinburgh, is the genuine one. Neither of them, we are sure, can be properly authenticated. The one at our college has had the repute of being Eclipse's for the last twenty years, and we do not altogether like, at our time of life, to have the "foundations of our faith" destroyed. Perhaps, as Mr Gamgee is a foreigner, he is not aware that it is usual in England for famous horses, as well as famous men, to possess a multiplicity of skeletons. If he has read up English history, he must have made acquaintance with the singular discovery of the Rev. Dean Swift, who, when on a visit to Oxford, had shown to him the skull of Oliver Cromwell. The Dean afterwards went to Cambridge, and was there shown another and a different shaped skull, which was also declared to be the skull of the kinglet Oliver. Swift immediately said, "Why, his skull was shown to me the other day at Oxford. He could not have had *two* skulls." "Oh yes, sir, he had," replied the Cambridge curator. "That at Oxford was his skull when a boy; this one is his skull when grown up a man, and the one he possessed at his death!" There are also no fewer than four skulls which are severally claimed as once the receptacles of the brain of Eugene Aram. The lantern of Guy Fawkes is at Oxford; Edinburgh also claims to possess the genuine trophy. This may be the case with Eclipse. As in Homer's case nine cities contested the distinction of giving him birth, so here two renowned cities contest the honour of preserving all that is mortal of the immortal Eclipse. We remain neutral; the point is hardly worth contesting.—Mr Gamgee speaks of "Professor" Flower. Mr Flower, at the Royal College of Surgeons, though a most worthy man, is, in no sense of the term, a "Professor," his post of "Articulator" being a comparatively menial occupation. It is the custom, we believe, in Edinburgh for men to turn cottages into colleges, paddocks into "parks," and for vanity to elect its "Professors," and produce its parks where necessity compels an occupation or uses land as pasturage. There is another gentleman at our Royal College of Surgeons of the name of Flower, the successor of Mr Owen; but in no proper sense of the term is he a "Professor." The "College" is not a "University," and therefore cannot pro-

perly elect, appoint, or promote any of its officers to a *Professorship*. We contend that the heads of Universities only can appoint "Professors." When will mankind reach the goal of that admirable *simplicity* which constitutes the *beau ideal* of all greatness, whether in science or in art?—ED.]

To DR SHORTHOUSE, *Editor of the Sporting Times.*

SIR,—When I addressed the letter which you did me the honour to publish on March 4, I had no other motive for doing so than that of affording information which you appeared not to be in possession of. In your Inaugural Address occurs the following words:—"It may be said that if we accustom ourselves to speak the truth, the whole truth, and nothing but the truth, . . . *establishments* will be closed against us. This is of little moment." In the course of your own remarks on my letter you say, "We were aware when we wrote the reply to Sir J. B. that Mr Gamgee had a skeleton which was reported to be Eclipse's. But it is just possible that neither the one in the Museum of our Royal College, nor the one in Mr Gamgee's, is the genuine one. . . . The one at our college has had the repute of being Eclipse's for the last twenty years, *and we do not altogether like, at our time of life, to have the foundations of our faith destroyed.*" You say again, "We remain neutral; the point is hardly worth contesting."

I beg now to submit the question, Whether your reply to Sir J. B. was in accordance with the motto which you adopted—"To speak the truth, the whole truth, and nothing but the truth;" or whether the adhesion to a foregone determination, in defiance of evidence, because you "do not altogether like," at your "time of life," to have "the foundations of your faith destroyed," was in harmony with the above motto? Moreover, I beg to question the policy of raising fictitious questions, and then declaring "we remain neutral." The old adage of setting a town on fire, and running away by the light of it, comes to mind here. Everything relating to the history of Eclipse and his skeleton was so fully discussed four years ago, that I have not the inclination, even if I could spare the time, to go over the whole subject again now. This much, however, I may add, that no horse on record that I have heard of, has been proclaimed to the world so fully, reliably, and had a career marked by so many historical incidents as was the case with Eclipse. He was bred by a prince of the realm in Windsor Great Park, and was sold, after the death of his royal breeder, at a public auction in London, on which occasion some remarkable events occurred, which afterwards became part of the horse's history.

Next we have the published and verbally-handed-down accounts of Eclipse's racing career, whilst he was the property of the Messrs Wildman and Dennis O'Kelly, and when the last named gentleman became his sole owner, in whose possession Eclipse retired victorious from the turf, and passed through his unrivalled career as a stallion. After being twenty years in the possession of his second owners (confederates) Eclipse died, and due care was taken to have his skeleton prepared, by careful dissection, by the man who, at that time, occupied the first position in England as an anatomist of the horse. The rest of the tale is soon told. Not long after Mr Vial de Sain Bel had dissected Eclipse, and written an essay on the proportions of that horse, death removed him from his sphere of labours, in the then newly-established Veterinary College, where he had been made professor. At this juncture, Mr O'Kelly presented the Eclipse skeleton to Mr Bond, a veterinary surgeon in London, who had been Sain Bel's pupil and assistant. After the death of Bond, his widow presented the Eclipse skeleton to Mr Bracy Clark, another former pupil of Sain Bel's, and the intimate friend of her husband, to whom he had rendered many kind services. The subsequent transfer of the Eclipse skeleton to the New Veterinary College has been sufficiently dwelt on already; therefore I ask, What ground ever existed for the foundation of a report of Eclipse's skeleton being in the Hunterian Museum? I affirm, none whatever; and having narrated the positive facts connected with the case, I think I may, after the challenge received, notice some negative incidents relative to it. More than forty years ago, when I attended the anatomical classes at the old school in Windmill Street, (rendered so famous by the brothers Hunter,) not only was there no skeleton of the horse, reputed to be that of Eclipse, amongst John Hunter's collection, but nothing of the kind was even mentioned.

I come now in my narrative to a period near twenty years from the present time, when, and for several years afterwards, members of my family were constantly attending as students at the Hunterian Museum, with whom I was regularly in the habit of

communicating. I can therefore vouch that no skeleton of the horse, reputed to be that of Eclipse, was during these periods in the Hunterian Museum. Lastly, when, about six years ago, I visited the Royal College of Surgeons, expressly with the object of inspecting the museum, in reply to interrogations about specimens of the osteology of the horse, I was told, "We have no good skeleton of the horse in the museum,"—a fact soon demonstratively confirmed, when I saw the one there articulated and in possession, of no repute and of no special value.

Permit me therefore, sir, to say that in this argument the *onus probandi* devolves on yourself.

Regarding your personal remarks, evidence is again afforded of conclusions arrived at without premises. Essex-born and bred men like myself would seem to be about the last amongst the Queen's lieges who could be taken for foreigners. Nor does a few years' residence abroad usually deprive a man of his nationality, or confer the privilege of assuming that of the country in which hospitality has been shown him. —I am, sir, your most obedient servant, JOSEPH GAMGEE.

NEW VETERINARY COLLEGE, *Mar.* 9, 1865.

IMPORTANT CASE TO DEALERS.

SILLENCE *v.* POTHECARY.—(Jury Case.)

(*From the Hampshire Chronicle, February* 11, 1865.)

THE plaintiff, Mr Benjamin Sillence, is the well-known farmer and dealer in this county, who resides at New Barn, Compton, and the defendant is Mr T. Pothecary, also a farmer and dealer, residing at Newton Stacey, near Stockbridge. Mr W. Bailey appeared for defendant; Mr Sillence conducted his own case. The action was brought to recover compensation in consequence of some pigs which plaintiff had purchased of defendant turning out unsound, the damage being laid in the particulars of claim at £50.

Mr Sillence stated that he had bought a quantity of pigs in the Winchester market of defendant, upon the representation or warranty that they were sound, whereas they had turned out to be diseased with a malady known as the cattle murraine. He thought the case was a most important one, inasmuch as the practice of selling diseased animals in the market, for a long time past, had caused great dissatisfaction, so much so that many farmers and graziers were now afraid to enter the market. The disease with which these animals were afflicted was so destructive that scarcely one ever survived it; and it might safely be stated that nineteen out of twenty died in it. It was a very contagious malady; so that animals of the pig-kind, if they came in contact with it on the road, or even on one's own premises, they were almost sure to catch it. Mr Pothecary was a large dealer in pigs, and it had been mooted in his favour, that unless a vendor gave a written warranty, a purchaser could have no claim: so that if a dealer once managed to get such animals out of his hand, the purchaser could sustain no claim for compensation.

Judge.—There is no law of the kind.

Plaintiff said it was the custom of the country to buy such stock, relying upon the honour of the seller. If he did not say anything to the contrary, the customer had a right to consider the animals as sound, such animals always being supposed to be sound.

Judge.—The law does not assume the animals to be sound. There must be a warranty or representation that they are sound.

Plaintiff continued—On Saturday, the 5th November last, he went to the Winchester market, where he saw defendant, with whom for a long period he had been in the habit of dealing. After examining one lot of pigs at 40s. a piece, defendant showed him a second and a third lot, the last being composed of thirty animals, which defendant said he would warrant to be good sound animals, and such as would suit him (plaintiff) well. Defendant further said to Mr Sillence, "You have bought a good many pigs of me; I'll warrant that they will suit you better than any you

have ever bought of me." Plaintiff stated that he asked him where he got the pigs from, and he replied that he had them from a farmyard the day before; but this he (plaintiff) said he had since ascertained was not correct. Defendant asked 23s. each for the animals, and, relying upon what had been stated, plaintiff offered 22s. a piece for them, and the bargain was struck for the thirty animals. He also bought some pigs of a Mr Broad at the same time. The pigs were driven to Mr Sillence's, and next morning his man perceived something was the matter with them, which he did not observe the night before, because it was dark when they arrived. On the following Monday plaintiff left his home at an early hour; but his man pressed him to examine the pigs, as they were in a very relaxed condition, and a serious nuisance. He saw them, and directed the man to give them beans. He was engaged much during that week, but saw them two or three times, and they appeared to be very ill. Many of them refused to eat, and one died in the course of the week. Two more died on the following Tuesday, and in a few days more fourteen were dead, and twenty-three or twenty-four died in all. He saw defendant at Andover fair, on the 17th November; told him the state of the animals, and he replied that it was a bad job; he was sorry plaintiff had them; but it could not be expected that he (plaintiff) should lose the money. Defendant said he would see the party of whom he had bought the pigs, would meet plaintiff at Winchester the next Saturday, and he would then put the matter right. He asked plaintiff if he had written to Mr Broad, who "ought to share in with them;" and he replied that he had not, for he did not believe Mr Broad's animals were diseased before they came in contact with defendant's, and therefore he should not be justified in doing so. The pigs he bought of Mr Broad did not show any signs of disease for nine or ten days. On the Saturday following he again met defendant in the market at Winchester, when defendant said —"Mr Sillence, this is a bad job for me; I am sorry for it. The other parties won't allow a penny, but I will give you five pounds or five guineas to settle it." Plaintiff refused this offer, considering it as unreasonable, as fourteen were then dead, and fourteen more had been separated from the rest, to see whether the disease could be arrested by so doing. Plaintiff again saw Mr Pothecary on a subsequent occasion, when he got in a rage, accusing plaintiff with annoying him by sending a most "unanimous" letter. He then declared he would not allow plaintiff a farthing damage, and told him to do his best. He had therefore brought this action.

In answer to Mr Bailey, plaintiff acknowledged that the pigs appeared to be sound. Those he had bought of Mr Broad were mixed with those he had from Mr Pothecary almost directly. Some of Mr Broad's pigs were "killed to save their lives." The disease was very common now. He bought forty-five pigs altogether of defendant and Mr Broad. Defendant did not say, "Rather than this should have happened I would have given £5;" but what he (plaintiff) had stated.

To his Honour.—I relied upon defendant's warranty when I bought the pigs, and had he not told me they came out of a farmyard the day before, I would not have bought them.

To Mr Bailey.—Defendant volunteered the statement that the animals were sound.

In answer to the Judge, plaintiff further stated that if anybody had asked him next day if he had a warranty with the pigs, he should have replied that he had.

Charles Street, in the service of plaintiff, was then called, who proved the sad state the pigs were in when they were brought home, and afterwards.

His Honour expressed some surprise that a veterinary surgeon had not been called in to examine the animals after they were dead. He might then have given the Court information as to their actual state; but plaintiff explained this by stating that he knew, perhaps, more about the disease than a veterinary surgeon would. The disease appeared to strike into the whole system, and showed itself externally in the skin. He thought it was small-pox—just the same disease as the Wiltshire sheep suffered from some time since. There was no cure for it.

Mr Bailey (to Street.)—What is this mysterious disease?

Street.—I call it "diseased murraine."

His Honour inquired the total loss to the plaintiff.

Mr Sillence.—I believe that twenty-three died, nineteen were killed, and two are still living.

Mr Hall, another farmer, said he bought twenty-five pigs, at 45s. a piece, from defendant. Twenty-three of them died, some before a week had passed. Others got infected; so that his entire loss by the deal amounted to £150. He had every reason to believe that his stock were all right before he placed those he bought of defendant with them. He had no warranty with them. It was customary to say they were all right when bought.

Plaintiff.—The purchase was made by the witness on the 5th of November out of the same herd as mine.

Mr Sillence, of Hinton Ampner, farmer, said he bought eighteen pigs of Mr Pothecary on the same day. They had the disease. Three died, and one hundred and twenty-five others caught it from the eighteen sent home. The whole one hundred and twenty-five died, and were worth 15s. a piece. He was obliged to kill more to prevent the disease spreading further. The pigs showed the disease nine days after the purchase.

Mr Bailey then addressed the jury for the defence, and urged that plaintiff, before he could have a verdict, must show conclusively, first, that there was a warranty as to their soundness; and if he succeeded in doing that, he must show, also, that at the very time of the sale the animals had in them the seeds of that disease from which they afterwards died. There was nothing at all said about a warranty to the defendant, and it had not even been mentioned in the particulars of claim. After ably commenting upon the insufficiency of the evidence to prove these facts, he called the defendant, Mr Pothecary, who stated that he had attended Winchester market for the past fifteen or sixteen years. On the day he sold the animals to plaintiff he brought in something more than one hundred pigs in the same lot. Mr Lloyd Broad was present at the time of the purchase. Plaintiff did not ask whether the animals were sound, and he (defendant) made use of no words warranting them. It was not customary in Winchester market to warrant them. He never did. On Saturday, the 12th November, plaintiff asked him about Mr Broad, but made no complaint whatever. He saw him at Andover on the following Thursday, when plaintiff said three of the pigs were dead. He (defendant) said he was sorry for that. Plaintiff asked who he bought them of, and he told him of Mr Pearce. He (defendant) said nothing about a warranty. On the following Saturday he saw plaintiff at Winchester, and asked him about the pigs, when plaintiff said he knew how they were when they were sold. Defendant said that was not correct, and afterwards that he would sooner have given five or ten pounds than anything should have happened. On the 18th November he received a letter asking him to take away the pigs, suggesting that they should be killed, and threatening an action for bringing diseased animals for sale into the market. He bought the pigs in Andover market. Plaintiff had never alluded to a warranty, and as far as he (defendant) knew, the pigs were sound at the time of the sale. That same day he sold three lots to other gentlemen, who had made no complaint.

To Plaintiff.—He did not say, "Write to Mr Broad, and let us share the expenses." He did not say in Winchester market that the other parties would not allow a farthing towards the expenses. To his knowledge he never had a pig die on his farm of cattle murraine.

Mr Broad, of Preston Candover, said he was present during the purchase, and did not hear a word about a warranty, and he believed he heard all that was said.

Mr Pearce, farmer, near Andover, said he sold defendant some pigs, which he believed to be sound. It was not customary to warrant such animals. He believed that the pigs, or at least a portion of them, were the same as those sold by defendant to Mr Sillence.

This was the case, and plaintiff offered a few remarks to the jury upon the evidence, after which his Honour summed up; and the jury returned a verdict for defendant, upon the ground that no warranty had been proved.

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THE VETERINARY REVIEW

AND

Stockowners' Journal.

ORIGINAL COMMUNICATIONS AND CASES.

The Siberian Boil-Plague. By JOHN GAMGEE, Principal of the New Veterinary College, Edinburgh.

THERE is something so terrible in the prospect, however slender, of an approaching plague, that any hint as to the possibility of such an event creates the greatest alarm. It is strange, but true, that we fear the ills that threaten more than those that directly afflict us. We are not kept in constant terror by the typhus and typhoid fevers which are preying on useful lives here; nor are we disposed to listen to any observations on the means whereby existing cattle-plagues may be exterminated. The announcement, however, that the people of St Petersburg are being decimated by "the black death," or that the cattle of Podolia have the Russian steppe-plague, may prove quite sufficient to give rise to a panic, and suggest numerous attacks on Government for its remissness in collecting information, or in encircling our islands with fancied shields capable of resisting any deadly pestilence.

What a commotion about nothing have we not witnessed during the past month! The death of three fever-stricken physicians in Dundee last year, the short intervals at which no less than seven worthy doctors have fallen victims to fever in Greenock, the steady rising in the number of cases of typhus in Glasgow, London, and other cities in these isles, have produced no such effect on the public mind and the legislature as the death of two physicians, first reported as *forty*, and a few dozen Russian labourers, in or near St Petersburg.

Fortunately for us all, railroads and telegraphic communication are speedily correcting the state of ignorance in which we have been living, concerning the good and the bad, which nature has bestowed on mankind in various parts of the world. The evils attendant on the

great diversity of tongues seem to be fast vanishing, though it must be confessed that industrious men might, especially on questions affecting the health of men and animals, prevent much of the unnecessary alarm occasionally created by disseminating knowledge concerning such events as plague-manifestations, and preventing the egregious blunders recently committed.

What do we know of Asiatic diseases? We refer small-pox, cholera, boil-plagues, cattle-diseases, &c., to the East, but of what occurs beyond the frontiers of European Russia we know much too little. There are records of great value, no doubt, in the archives of the government of the Czar; there are pamphlets and works relating to direct observations of the diseases of Siberia and Southern or Eastern Asia, but we know little or nothing of them. We are usually content with referring certain epidemics and epizootics to broad uncultivated plains, in the direction of which we can trace such maladies, and where we believe they are alone capable of spontaneous development.

The idea still seems preposterous to some that true plagues are never generated spontaneously. They creep, however, from place to place until a combination of circumstances intensify the effects of poisons, which, perhaps for ages, have not been allowed to die. The small-pox lymph, the virus of hydrophobia, the pestilential emanations from droves of cattle affected with contagious typhoid, or the killing breath of oxen suffering from pleuropneumonia, do not owe their origin to local and accidental influences, but to that same system of propagation which nature has ordained for the multiplication of animals and plants. It is strange, but certain, that an undeviating process of generation is as prolific in perpetuating certain plagues as it is in peopling the globe. It is clearly the duty of men of science to devote very special attention to the maladies which are propagated without regard to conditions of soil or climate, and to distinguish these, which I call *true plagues*, from diseases constantly developing, owing to inborn tendencies, in men or animals, or to the operation of such causes as heat and cold, drought or deluge, dirt or famine.

Throughout the known world, certain maladies, capable of suddenly affecting and destroying a large number of animals or plants, undoubtedly arise, from circumstances not altogether foreign to the parts where the diseases appear. Indeed, I know of no country where a certain degree of cold or heat, rain or snow, may not directly induce a somewhat remarkable mortality amongst men or animals. Civilisation has been tending, though slowly, to the diminution of pure endemic and enzootic disorders, inasmuch as natural influences are counteracted by artificial conditions; and the hot summer, which on some ill-drained lands would really have bred, what some might call a plague amongst men and animals, has now no effect on the same lands well-drained, where the soil is ploughed deeply and regularly,

and abundant crops are reared with the aid of artificial manures. There are ague-stricken countries and broad fens, where malignant boils destroy human beings, or any warm-blooded animals, so soon as the summer heat is sufficiently intense; and shepherds migrate with their flocks from unhealthy plains, to mountain pastures, in order to escape a certain death. We need only visit the garden of Europe, the Apennines, and the Sicilian valleys, to test the truth of these remarks. Such examples of disease-generating districts are numerous, but from their usual isolation, and the conditions under which the people of these times exist, we have no such appalling results as those which furnished thrilling themes, on which the classical writers of old dilated with so much effect.

No well-informed person can doubt that the contagious pestilences of men and animals, of the majority of which we have only traditional accounts, belong to the ever-recurring pustular plagues, represented now-a-days by the milder and localised outbreaks of malignant anthrax, malignant pustule, milzbrand, &c., which have lost all their terrible features, especially in our healthy islands. Wild animals, as well as domestic, fell victims to infection, in former times, and still succumb where boil-plagues prevail. It is, indeed, an error to imagine that domesticity and civilisation breed disease. I am strongly disposed to believe the very reverse. Maladies of a peculiar kind appear; but, on the whole, the terrible devastations, even of the 18th century, exceeded in virulence and numerical results anything that has been witnessed since 1800. As man advances in knowledge and wealth, cultivating the soil that it may yield its utmost, and engaging in commerce or intellectual pursuits, he is certainly less liable to such plagues; and the annihilations which we are told awakened new life—the extraordinary "alternations of life and death," of times gone by—operate now on very limited areas of the earth's surface.

Hecker* says:—"Were it in any degree within the power of human research to draw up, in a vivid and connected form, a historical sketch of such mighty events, after the manner of the historians of wars and battles, and the migrations of nations, we might then arrive at clear views with respect to the mental development of the human race, and the ways of Providence would be more plainly discernible. It would then be demonstrable, that the mind of nations is deeply affected by the destructive conflict of the powers of nature, and that great disasters lead to striking changes in general civilisation. For all that exists in man, whether good or evil, is rendered conspicuous by the presence of great danger."

For the history of plagues to be written, as Hecker desires, we need information which has been lost. Yet much remains to demon-

* The Epidemics of the Middle Ages, from the German, by Dr Hecker. Translated by B. G. Babington, M.D., F.R.S. London: Trübner & Co. 1859.

strate that the beneficent object of nature, even in the production and dissemination of plagues, has been to make men better and wiser than they were. Industry has done much for longevity in man, and there are records of noble victories gained by man's intellect over the destructive influences which must, no doubt, have been destined for our ultimate good. Jenner taught us how to annihilate small-pox in man, and a thorough study of the history, geographical distribution, and progress of every other plague, will enable us to circumscribe outbreaks of diseases still dreaded by Europeans. The terror of unexpected death, by the loathsome diseases of old, is now rare and fleeting. The day must arrive, when all cause of fear will be effectually and satisfactorily removed; and my object is to show that, had we been at all informed on the subject of the Siberian boil-plague, the early telegrams from Berlin, announcing the appearance of that disease, would not have produced the effect they did.

Synonyms and Definition.—Jaswo, Mohmo, Naguptan by the Tartars, Morowaja, Jaswa, Schelwaki, or boils, Wetrenitza, Powetrie, Wosduschnaja Bolesu; these are the local Siberian and Russian names.* In German it has been called Sibirische Pest, Sibirische Seuche; Beulen Seuche, Pestblatter, Wind oder, Luftseuche, Schwarze Krankheit, Brandheulen, and Haupt says that the best name would be Sibirische Milzbrand.

The Siberian boil-plague is a contagious disease, said to be capable of spontaneous development during the hottest months of the year, in man and in the horse; it has been traced to Eastern and South-eastern Asia, from whence it spreads usually in a westward direction, attacking most of the provinces of European Russia, where it also not unfrequently occurs as an endemic, but as a rule never extending beyond the Russian dominions. It is characterised in man by painful gangrenous boils, which form on any part of the body, and give rise to a fever of a malignant type, of which the leading symptoms are difficult breathing, sense of great weight on the chest, frequent and faltering pulse, dizziness, or fainting, nausea, vomiting, constipation followed by diarrhœa, convulsions, and death. It presents itself in the form of a relapsing as well as a continued fever. Though some observers speak of the Siberian plague as affecting cattle, sheep, swine, and other animals, it is asserted by authentic writers that it differs from ordinary anthrax in attacking men and horses alone, and not being readily communicable from the one to the other. Horned cattle are occasionally attacked with a disease very similar to the boil-plague when this disease is raging, and probably the bovine species must be included in the list of creatures subject to this fearful disease.

Geographical Distribution.—The Siberian boil-plague owes its usual

* Haupt Ueber einige Seuchenkrankheiten der Hausthiere in Sibirien.—Von Wilhelm Haupt, Berlin. 1845.

name to the fact that Gmelin first reported on it as observed by him between the years 1733 and 1743, in Western Siberia. It appears to have been originally imported from Mantchooria in Eastern Asia, having been traced to the neighbourhood of the river Soongari. It first penetrated South-western Siberia, and found its way through the Kirghiz steppe to the shores of the Caspian, the plains around the Ural Mountains, and some of the well-watered lands around the Wolga. We have no record of the Siberian boil-plague prior to 1700, and it was believed by Gmelin and others not to be an old disease when first described in the early part of the eighteenth century. It is difficult to say if it be the representative of the terrible oriental plague of five hundred years back, shorn, however, of its worst features. It is somewhat strange that the first accounts of the black death are found in the East, though little was heard of it until its appearance in Western Asia. It has been supposed to have begun in China. "From China, the route of the caravans lay to the north of the Caspian Sea, through Central Asia to Tauris. Here ships were ready to take the produce of the East to Constantinople, the capital of commerce, and the medium of connexion between Asia, Europe, and Africa. Other caravans went from India to Asia Minor, and touched at the cities south of the Caspian Sea; and lastly, from Bagdad, through Arabia to Egypt; also the maritime communication on the Red Sea, from India to Arabia and Egypt, was not inconsiderable. In all these directions contagion made its way; and doubtless Constantinople and the harbours of Asia Minor are to be regarded as the foci of infection, whence it radiated to the most distant seaports and islands." *

The black death of the fourteenth century not only invaded the Mediterranean islands and seaports in all directions, but it spread over the European continent, and what is most remarkable, did not make its appearance in Russia "until 1351, more than three years after it had broken out in Constantinople. Instead of advancing in a north-westerly direction from Tauris and from the Caspian Sea, it had thus made the great circuit of the Black Sea, by way of Constantinople, Southern and Central Europe, England, the northern kingdoms, and Poland, before it reached the Russian territories; *a phenomenon which has not again occurred with respect to more recent pestilences originating in Asia.*" †

Whatever there may be of similarity between the great mortality of old, and the Siberian boil-plague of modern times, consists perhaps more in simple geographical distribution than essential pathological characters; and Hecker specially refers to the spitting of blood, the infallible diagnostic of the black death, as not occurring in the milder "indigenous plague," which no doubt often was an anthracoid affection, such as the one so often witnessed in Russia. It is cer-

* Hecker, loc. cit. † Idem.

tainly remarkable, that so far as we are at present informed, the Siberian boil-plague, or the true black death, owes its origin to thinly-peopled regions in Eastern Asia, where rivers overflow, tempests are not uncommon, terrestrial commotions prevail, a rank vegetation and organic debris putrify under the influence of excessive heat, and the soil seems, if we are to judge from results, occasionally to vomit forth pestilential miasmata which give rise to plagues of a highly communicable type.

It is somewhat difficult to understand that a disease, originally introduced as a purely imported plague, should remain for ever after an endemic or enzootic in the Russian dominions. We certainly have instances of maladies kept up by the original cause—*contagion*—which led to their introduction in any new land, as with the contagious bovine pleuropneumonia, of our own country, America, the Australian colonies, &c.; but there, more or less, the malady always prevails—it does not die out and recur. It is said of the Siberian boil-plague that it breaks out suddenly in June or July, and ceases in August, very rarely victimising animals or men later on in the autumn, and never in winter or early spring. This would certainly point to the malady being, and perhaps having always been, endemic or enzootic in Russia, though severe outbreaks might be aggravated by extensions of the same contagion from very unhealthy parts of Asia beyond the Russian frontiers.

Haupt tells us that the portions of the Russian dominions, and especially of Siberia, where the disease appears most rife, are from Yameshevsk to Omsk on the Irtish and Kirghiz line, on the borders of the Irtish up to Yara, spreading somewhat westward, and extending up between the Ural Mountains and the River Obi, thus approaching the Arctic Ocean. The whole of the Tobolsk government is more or less infested with it. Much less so do we find it, though it is still endemic, in the vicinity of Irkutsk on the shores of Lake Baikal. To a certain extent, it occurs almost every summer amongst the Christian villages and settlements from Udinsk, Jerginsk, along the borders of the River Seleuga, across the Altaian Mountains, to the Kirghiz Steppes. Dr Meyer, who travelled through these steppes in 1826, asserts that the boil-plague attacks animals, and rarely men, in their western portion more than the eastern.

There are not a few high-lying hilly districts and table-lands where the malady has never or very rarely been seen. Haupt, Ledebour, Meyer, Pallas, Georgi, and others refer to such healthy parts, where men nor animals have never been affected with the disease. From the descriptions given of these places, some as high as 2346 feet above the level of the sea, surrounded by mountains of which not a few are covered with everlasting snow, it is possible that their healthiness, or rather freedom from the Siberian boil-plague, may depend on distance from through routes, along which contagious disorders specially spread. Anthracic diseases of a purely endemic character are by no means rare in mountain regions, though contagious diseases

spread slowly wherever great obstacles to communication amongst men and animals are met at every step.

It is certainly singular that so interesting and destructive a malady as the one under consideration should have claimed the attention of the learned to so slight an extent, that no satisfactory history of its individual outbreaks has been written.

Steller first observed the boil-plague in Tobolsk in 1738, when it affected horses, cattle, and men. The elder Gmelin* mentions that the malady prevailed at Tara in 1741, but it spared men and attacked the horses. In 1757 the summer heat suddenly attained a very high degree, and in the Dorpat district alone, Fisscher† says that 1500 horses died of the boil-plague. The mortality suddenly ceased with the occurrence of a shower. Haartmann‡ states that an incredible number of horses died at the same time in Finland; human beings died, and some oxen were also seized.

In 1772, Georgi§ saw the malady in Eastern Asia, in the district of Dauria, on the banks of the river Argun, and in the Nertchinsk Steppes, where it destroyed half the horses of these regions, sparing those of the native and heathen population, but attacking fiercely those of the Christian settlers. Heusinger quotes Falk's remarks‖ made after his journeys in Siberia from 1768 to 1773. Falk says:—"It is common over the whole of Southern Siberia, from the Ural Mountains to the Chinese frontiers, and especially on the Irtish and its tributaries; nevertheless, it does not appear to be altogether peculiar to Siberia, as here and there in the writings of physicians cases of disease are to be found described, the appearances of which present the greatest resemblance to the boil-plague. In Siberia it breaks out every year—sometimes here, sometimes there—often in several places; but it has not been observed to become quite general over the country."

At this period Pallas was also travelling, and alluded to the prevalence of the disease on the Soongarian Steppe, along the Siberian frontier to the Wolga, where it was less common than in the easterly districts. He does not mention it as occurring in Eastern Siberia, but alludes to sad devastations by the disease amongst the good horses of the people in the broad district watered by the river Iset. Hablizl, one of Pallas's contemporaries, alludes to the disease as specially rife after floods. A staff-surgeon about the same period reports on the disease as occurring annually amongst human beings, from the Caspian Sea along the border of the Terk.

Professor Udén, who, according to Heusinger, justly includes the

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* Gmelin J. G., Reise durch Sibirien. Göttingen, 1752.

† Liefl. landwb. p. 447. ‡ Abhandlungen, d. König. Schwed. Akad. vol. xx.

§ Georgi J. G. Bemerk, auf einer reise im Russichen Reiche. Petersburg, 1775.

‖ Falk J. P. Berträge zur topographischen Kenntniss der Russichen Reichs. Petersburg, 1785.

Siberian boil-plague in the general history of anthrax outbreaks, speaks of the disease as prevalent over a very wide extent of country in European and Asiatic Russia, and as having killed many horses, cattle, sheep, pigs, and men.

Haupt speaks from personal inquiries and observations for a period extending from 1810 to 1823, and alludes to the fact that in Eastern Siberia, due north of the supposed original seat of the malady, it had not been known more than from thirty to sixty years. The disease seems to have been very fatal, especially on its first appearance, at each outbreak, from the year 1780 to 1800, but always less so in East than West Siberia. During the period of Haupt's observations the attacks over the country seem to have been more restricted and milder than before. Probably the ravages of the disorder had been mitigated by better treatment, for the renowned traveller Adolph Ermann,* whose journeys through Russia commenced in 1828, says, after referring to the tormenting flies and gnats of the swamps of Asiatic Russia:—"It is in the hot season, too, that that terror of natives and visitors, the Siberian plague (Sibirskaya yazva, as it is called) prevails. This malady is known to cut off frequently both men and cattle in the course of a few days. It is, however, much less feared now than formerly, as it has been found that puncturation with a needle upon the exposed parts of the person will, if promptly resorted to, always prevent the extension of the irritation and swelling which invariably accompany the progress of the disease.

I can add little to the above facts, relating to the history of the disorder. It is singular how few have referred to special outbreaks, and the most recent notice alluded to by that most indefatigable compiler, Heusinger, in his work published so late as 1850, is that of Gebler, who speaks of the disease as very prevalent in 1829, at Barnaul, in the government of Yomsk. The summer was rather dry and cool than hot, and the Siberian carbuncle began in the middle of July. Gebler compared it to the Hungarian anthrax (Schwarze blatter,) or the Swedish furia infernalis (Skott-sjukam,) and speaks of it as more severe than he had seen it previously. It is certain that the disorder has continued to appear yearly up to the present time, but invariably during the summer, and not attracting any special attention, from the usual character of its manifestations. Professor Unterberger, of Dorpat, spoke to me about it in 1863, and referred to it as one of the endemic plagues of Russia.

Causes of the Disease.—So far as we can learn, the malady has been traced invariably to the oppressive heat of summer. The mean temperature in July at Yakutsh is 68°8 Fahr.; but this is much exceeded in some parts, and at the same time the night temperature is very low. There are usually very sudden changes from cold to heat when the Siberian boil-plague manifests itself, whilst, on the other

* Travels in Siberia, by Adolph Ermann. Translated by William Desborough Cooley. London, 1848.

hand, it disappears rapidly if the temperature lowers speedily, or as the autumn sets in. Most observers admit, that outbreaks usually begin and cease in the months of May, June, July, and August, and the last two are probably the worst months for the disease. It has been known to break out suddenly in August and to cease in three weeks, committing sad havoc, so long as the heat was sufficient to induce it.

There are many records which tend to confirm Hablitzl's view, that inundations are prolific in causing outbreaks of the Siberian boil-plague. Rather unlike the contagious typhoid of the ox so prevalent in the Russian steppes, it is to be met with more in well-watered plains, free from the vast accumulations of brine, so common in the Russian dominions. The most remarkable and fertilising rivers of Siberia, or even of European Russia, as well as the inland seas, seem to saturate the soil periodically with superabundant moisture, favourable when a certain degree of heat occurs to the development of the Yaswa. The spring floods, when the snow and ice melts, heavy falls of dew in summer, &c., are often followed by the development of the disease.

It is common, therefore, on the rich and broad meadow lands, which are here and there disposed to be swampy, or on the wide plains through which rivers flow, which are often nearly dry in summer, where waters fit for the use of men and animals is only to be had on the surface in spring, though at any spot the soil, which is hard and dry, may be tapped with effect, and wells of this description have to be constantly bored.

Although the Siberian boil-plague occurs annually to a greater or less extent, all observers have noticed the recurrence of severe and wide-spread outbreaks at intervals varying from ten to fifteen years. As many natural phenomena manifest a very remarkable periodicity, so do we recognise in disease a tendency to follow a similar law. This cannot be easily understood with regard to purely contagious diseases, and there is much need for very careful investigation into all circumstances which lead to the unusual development every now and then of the essentially contagious affections. With regard, however, to anthrax and the anthracoid maladies, including the Siberian boil-plague, we can readily understand the connexion between their unusual development and their atmospheric vicissitudes or other so-called "cosmical phenomena," which operate so largely in inducing or preventing such diseases.

Genelin, Haupt, and others, have noticed that during any special outbreak, there are days and weeks of greater mortality than others. Some days or weeks of serious illness are followed by brief healthy periods, and an aggravation of the disorder again occurs. It is always most fatal at the commencement of an outbreak, and the fever becomes less severe. We now know that the simplest sporadic affections manifest the most interesting periodicity with reference even

to remissions and exacerbations. The same applies especially to fevers and the various plagues.

Haupt asserts that the Siberian plague is most to be feared when the atmosphere is still, or during the prevalence of south and westerly winds. North and east winds are against its appearance, as also cold and wet weather.

In man, age and sex affect the development and severity of the disease. Males suffer more than females. Females experience less pain and recover more readily when attacked. Some say it never attacks children, whereas others assert that rare instances have occurred in early life, but the disease was mild and not fatal. There is but a slight disposition to attacks up to the age of twenty; from twenty to forty it is common; it becomes rare in people above forty, though it is very deadly when it attacks the old and infirm.

The malady usually commences among the lower classes, and there is no reason to doubt that the causes capable of inducing ordinary relapsing or famine-fever, have often combined to aggravate the genuine Siberian or Asiatic boil-plague. When the disease appears, however, the wealthy succumb, and there are many Siberian towns where persons of distinction, male and female, have died of the disease.

I have now to consider that most important question, the contagious character of the disease and the relations existing between these, in men and animals.

As with anthrax and all allied disease, it has been supposed that the poison capable of producing the boil-plague is transmitted from place to place by flies and insects. Acting on this belief the Siberians have been known to set fire to a house in which there was lying the dead body of a man, the first afflicted in a village, and who was supposed to have been contaminated by a sting. The face, scalp, and neck are so often the seats of the boils, and, indeed, so much more frequently than other parts of the body, that there appears to be almost as much foundation for this belief in relation to the boil-plague as to the ordinary malignant pustule. Whereas, however, there is a general unanimity of opinion regarding the invariable dependence of malignant pustule on communication from the lower animals, there is almost as decided a concurrence of statements with reference to the spontaneous and independent development of the Siberian boil-plague in man.

Animals Affected with the Disease.—Very precise information has been published regarding the manner and extent to which horses are affected, and no doubt many outbreaks are almost entirely confined to the equine species. Haupt is very distinct in his remarks on the almost complete immunity enjoyed by other animals during even severe manifestations of the Siberian boil-plague, and he has published information as to the number of horses attacked at stated periods. Thus, the chief of the Tobolsk government published a

list relating to an outbreak in the summer of 1822, before the 1st of July, when the number of horses affected is represented as follows:—

Villages.	No. of horses kept.	No. dead.	No. still ill on the 1st of July.	
Sutchewa, ...	83	35	7	
Rogosina, ...	17	9	—	
Adbaschsk,.....	156	2	—	These two cases occurred on the 17th to 24th June.
Owsanikowa, ...	36	1		Occurred on the 24th of June.
Rusanowa, ...	52	1		
Germakowa, ...	27	1		
Kopotulowa, ...	65	8		Occurred on the 25th of June.
Domaschnaja,.....	78	3		
Sünkowa, ...	25	1		
Burlakowa,..... ..	38	1		
Malkowa, ...	20	4	—	
Jurti Ji Statzkia,	146	12	1	
Baschajewa, ...	29	6	3	After the 1st July, 9 taken ill and 6 dead.
Druswanka, ...	45	5	4	
Kuliki, ...	50	1	2	
Bertschustny,.....	15	1	—	
Schorukowa, ...	25	—	1	
Zarewskaja,.....	23	2	—	
Besrukowa,.....	20	1	—	
No. of villages,. 19	950	94	18	

About 10 per cent., therefore, of the entire number of horses died of this one disease alone. It is also reported that in 1818, in the district of Jalutrovosk, 360 horses died out of 80,000 in the months of June and July. During the same months in 1821, in the town of Tobolsk, 100 horses fell ill out of a total of 1000, and 30 died.

Heusinger states that Steller, one of the oldest observers, spoke of the disease beginning amongst horses, and the most recent writer, Pobrowsky, also assures us that horses are first seized.

The fact that horses are affected more than men has been attributed to human beings experiencing some protection from their houses; horses that are constantly in the open air, grazing, &c., being specially seized in many districts.

Horned cattle are not very liable to the disease. In 1818 only 15 cows died out of 55,000, whilst the disease was raging amongst horses. In the outbreak of 1822 in one district only 2 cows out of 67 were affected, and in another district 4 cows were seized. Gmelin, Falk, and Ledebour assert positively that cattle are rarely affected, and Haupt trusts to his personal experiences in declaring that repeated cases of the disease in any animals besides horses are apt to be cases of other affections, raging at the time that the boil-plague is raging, but distinct from this malady. He specially indicates that where he observed the disease, that there were many more animals of other kinds than horses, but he never met with the disease except in the latter.

All agree that sheep are rarely attacked, and pigs have very rarely been referred to in connexion with the subject. Camels and goats have been reported as subject to it in rare instances.

Of the wild animals special notice has been taken of an outbreak amongst the dziggetais of the steppes, which are said by Wlassof to have been the first affected in 1779, and after them horses and even cattle were seized. Wrangell alludes to reindeer being affected at the same time that the boil-plague has been raging amongst men.

From all this we learn that, however similar the causes indueing the Siberian boil-plague may be to those giving rise to ordinary anthrax, there is an essential difference between the susceptibilities of different animals in relation to the two maladies. Anthrax originates principally in cattle, sheep, and pigs, and communicated by them to human beings. Horses are not so often affected as ruminants. The Siberian boil-plague is said to occur principally in men from causes apart from contagion; and, indeed, rarely have instances of communications from the equine species been noticed. Horses are principally affected, and independently of other quadrupeds: a clear distinction seems therefore to be established between ordinary anthrax and the Siberian plague.

(*To be continued.*)

Strangulated Inguinal Hernia and Rupture of the Stomach in a Horse. By G. Armatage, V.S. to Right Hon. the Earl Vane.

I am indebted to Mr A. Mann, sen., Lambton, for the morbid specimen which accompanies this report. The case possesses features of peculiar interest, and I think it is worthy of a place in our *Veterinary Records.*

The subject of this notice was a brown horse, 17 hands high, and about 14 or 15 years of age, used on the collieries of the Earl of Durham, principally as a crab-horse; that is, he was employed in a kind of windlass, by which the workmen are lowered or raised during their examination and repair of the pumps, &c., in shafts of coal-pits. Such an occupation is often long continued, necessitating an exposure frequently to most inclement weather; but when men are only to be lowered, the work is not considered laborious, nor was he found to suffer under it in any way whatever.

On one occasion, six years ago, when drawing coal-waggons on a slight gradient, he stumbled and fell, and was pushed along the rails by the waggons a distance of about thirty yards, receiving extensive bruises about the haunch, loins, and thighs, which appeared to be superficial, however, and were quite well in the space of a month, the animal being again put to crab-work, none the worse to all appearance. From this time till December last, he continued to work well, maintained his strength and condition, yet appeared somewhat

dull, but never requiring medical assistance. On the 12th of that month, he was seized with slight colic, for which Mr Mann prescribed an anodyne mixture, and returned to his work again in half an hour.

Nothing further took place until the 2d of the present month—March—when the driver again brought the animal, now *in extremis.* Symptoms were urgent, and speedily developed, consisting of hurried respiration, cold perspiration over the whole body, which, in the first instance, broke out abruptly on each side of the thorax, behind the shoulder. As he walked, he reeled, and when allowed to stand, trembled much, and with difficulty escaped falling. The hind legs were placed widely apart, and he constantly attempted to urinate, succeeding only in passing a few drops of normal-looking fluid. The eyeballs protruded in the extreme, the neck arched, and muscles strongly contracted, drawing the nose in close approximation to the chest, where it was retained.

The tongue black, and hung from the mouth, which was tightly closed, allowing, however, of white froth to be discharged in great quantities. Mucous and froth, of a dirty colour, also came from the nostrils profusely. The conjunctiva was of a pale yellow colour, with its network of vessels finely injected.

As nothing had passed his bowels for some time, it was attempted to introduce the hand, but this could not be effected, on account of extreme spasm. At times he would attempt to lie down, and continued thus—experiencing no relief from treatment—from 10 A.M. to 3 P.M., when he suddenly dropped dead.

From the first the pulse was imperceptible at the jaw and radius, accompanied with extreme coldness of the ears and extremities.

A *post-mortem* examination was commenced on the morning of the 3d instant.

On opening the abdomen, a considerable amount of fat adhered to the intestines; and about four gallons of red serum escaped from the opening made into the walls. About half the quantity of fluid also came away by the rectum, when the carcass was moved in the act of flaying.

The transverse colon exhibited a patch of peritoneal inflammation, six or eight inches in area; but all other tissues and viscera were blanched and flaccid.

Food was distributed throughout the cavity, and extended to the pelvis. The intestines were next turned aside, and found to contain fluid only; but in the omental sac was a large mass of half-masticated hay and oats, with whole beans, occupying a space equal to double the quantity found in any stomach in health. The small intestines were traced, when a portion was found to form an inguinal hernia, with adhesions; at the pyloric end it was free. The œsophagus was divided, when the cardiac portion of the stomach, on being raised, was discovered to be extensively lacerated along the greater curvature, and the lacerations extended to the pyloric half.

When this case was first related to me, and special reference made to

the apparent absence of much of the tissue composing the coats of the stomach, I fancied it might be a case of ulceration and perforation; but on carefully examining the parts, and ascertaining some of the facts, I can glean that the horse was first seized with symptoms of severe and unmoveable obstructions of the bowels. The tenesmus, violent contractions of the rectum on the arm being forced up, the partial sweats bedewing the body, indicate, with the aid of the information derived from *post-mortem* appearances, that the animal had a strangulated inguinal hernia. This is so rare in geldings that its having been overlooked need not astonish us, especially as the symptoms were very decidedly those of ruptured stomachs.

On examining the stomach and omentum at my leisure, I have found that the particles of undigested food still adhering to the omentum, indicate that the gastric laceration must have occurred shortly after the ingestion of a quantity of food. As is usual in these cases, the over-distended organ had become lacerated along the greater curvature by tearing of the peritoneal coat first, then of the muscular, which had receded so as to deceive one as to the amount of destruction the stomach had sustained, and the mucous membrane was soft and irregularly torn, and in a condition as if it had suffered somewhat from the action of the gastric juice.

This case is replete with interest, and it shows how careful we should be in diagnoscing cases which appear at first sight trivial and unimportant. Who thinks of examining the inguinal region of a gelding, though he may be suffering from some extraordinary and unaccountable obstruction? It is very important to make a close examination in all cases in which injections cannot be given or retained in the rectum. The strangulation in the case above related cannot have occurred before the horse had taken the full meal which rendered possible the rupture of the stomach, and I am disposed to believe that the animal was fresh and well until he took his last feed, after which the strangulation supervened, and this indirectly led, through the horse knocking himself about, &c., to the coats of the stomach giving way.

When I say that the horse was perfectly well before the last attack, which ended in his death, I do not wish it to be understood that he was entirely free from inguinal hernia, as few will doubt that, in all probability, the inguinal hernia, with its adhesions, had existed for some time, and at last led to the horse's sudden destruction through one of the many causes which are capable of producing a hernial strangulation.

Preliminary Examinations, with Reflections on some Epochs in the History of the Veterinary Art. By JOSEPH GAMGEE, Senior.

WHETHER it be advisable to institute preliminary examinations for candidates for studentship at the veterinary colleges, is a questions which has from time to time been discussed, without any apparent advance being made towards its solution, or the exhibition of much argument in favour of the measure.

Some years ago, at the time when veterinary periodicals were first established, the general questions relating to modes of granting diplomas, and the pursuance of a curriculum of instruction, were freely discussed under various aspects, according to the views entertained by the men of progress at that time. Preliminary examination was then, amongst other means, suggested as calculated to guard against the admission of men insufficiently educated into the ranks of the profession.

At the time referred to, it was felt to be a peculiar hardship by some of the most distinguished members of the veterinary profession, that they were emphatically denied all participation in testing the fitness of candidates to receive the diploma, or in testifying to their fitness to practise the art; and as they saw men entering at the Royal Veterinary College, of all ages and conditions, who in the space of from six to nine months after were, with few exceptions, allowed to pass the Board, and pronounced to be duly qualified to practise the veterinary art, they justly showed umbrage at the impolitic course so prevalent. Systematically shut out from deliberative assistance on all matters concerning their own profession, many of those talented members were determined to begin to attack the abuses at some one point; and, therefore, the question of fitness for admission at the College was raised.

Comparisons were made of the courses adopted at the veterinary schools of France and those laid down in the programme on the establishment of the London College; with the unsystematic manner subsequently carried out in practice at the last-named institution.

The comparisons were fallacious, because partially drawn; there being hardly any resemblance between the French and English veterinary schools. The first were fostered by Government support, and conducted under a modified military discipline, where the students fulfilled the first avowed objects of the State, these being the obtainment of able practitioners for the army service, departmental towns, and agricultural districts. Four years of systematic training was the least admissible course prior to granting the final examination; and to enable youths to devote that time, the State helped them by providing board and instruction at a charge below cost. Conditions were attached to these privileges; the candidate had to afford documentary proof from his birth-place, of age, character, parentage, &c., and farther to submit to an ordeal to test the extent of

preparatory scholastic knowledge possessed, and also some pertaining to the veterinary art.

In England, in accordance with our free and self-supporting systems, Government took no farther heed about the obtainment of able veterinary surgeons, than that of sanctioning the school and granting a military status to members admitted into the army service. The students received no aid from the State as in France.

One great mistake made by its managers in the early stage of the London Veterinary College was, the election of one professor only, into whose hands all control and emoluments converged; every guinea which was paid as entrance-fee by pupils went into his private purse. The professor filled, besides the College chair, a multiplicity of official appointments, which, in the aggregate, gave an annual income reported at the time to have ranged between three and four thousand pounds per annum,—a sum sufficient to have commanded a staff of the most talented teachers of veterinary science that Europe could have furnished. Ninety lectures, or thereabout, were delivered at our College during the session, and the twenty guineas admission-fee, as might have been anticipated, formed a premium for allowing numbers to enter, without questions as to their capability of profiting by the course; and rapid exit from the College, with admission into the professional body, was permitted, which encouraged others to enter—ours being the only one amongst the professions that could be decided on, qualified for, and entered into within the space of a year. A royal road was, in fact, opened, affording quick and easy change from a nondescript person to the man of professional status, and the attempt to alter for the better such a state of things some years later, by merely extemporising a few questions to be answered before admission to studentship, was not affording evidence of much understanding of the many shortcomings, which required change before a course of instruction could be provided and discipline established, such as an art like that of veterinary medicine and surgery urgently required.

From comparing with foreign veterinary schools as in time past, it has of late become the fashion to vie with the universities and medical schools of our own country, but without profiting by the great reforms that have taken place at these; selecting for imitation only an incidental and most recent step—that of preliminary examination; yet no analogy can be shown, and such hastily drawn comparisons, and precipitate action taken on them, are liable to lead to any but good practical results. There is a wide difference between the work required and time to be devoted before a degree in medicine or surgery can be obtained, and that which the Royal College of Veterinary Surgeons deems sufficient; and whether admitted or not, it is a fact, that the work of the veterinarian differs greatly from the calling of the physician and surgeon, and it seems to me that our proper course is, to emulate the older institutions in the solid and essentially scien-

tific and professional work, leaving for a while, at least, the preparatory scholarship test open.

The great improvements which have been going on for centuries in the universities and medical schools, the advances in all pursuits which extend the borders of knowledge, not only of the science of human medicine, but of the veterinary art, has rendered the work of the student so much greater than formerly, that the time devoted to study has been enlarged, and four years is now the minimum period of systematic work that will suffice before a degree in medicine can be obtained. So pressed for time to do the necessary work are the students, that it has been deemed expedient by the boards and directors, to institute examinations in arts, as a prior step, in order to ensure a high standard of learning amongst physicians and surgeons, without allowing the scholastic to clash with the professional subjects, so that the last may have their undivided energies during the four years allotted.

An old proverb with the Italians says, "The fathers of citizen families, who have three sons, usually destine the most promising and talented to follow the legal profession, the second one, tried by the same test, is sent to study medicine, and the third, and least active of the three, becomes a priest." In our country, where high scholastic acquirements in young men is at a premium, we should not only have church, law, and medicine before us, but with an infinity of brilliant careers open to compete for by young men, we could hardly expect to be last among the bodies who seek new life and social strength from the dawn of manhood. Whereas, by leaving our portals open as heretofore, and inviting the really eligible to veterinary studentship—viz., the lovers of animals, men who have been bred amongst them, and who to some extent have acquired habits in their management;—these, who will not only, in many instances, bring much scholastic lore, but they will do what others have all along done; they will bring sound vigorous minds and hands, used to work, which with honest-looking English, Scottish, and Irish faces, should find a welcome reception at any veterinary school in the kingdom; and if such men cannot be made good veterinary practitioners, the fault must be sought in the system, and not the men.

In veterinary practice, instead of wanting to obtain all men alike, the reverse should be the aim, and, if freedom be allowed, the men will come from places to which they will go back again; and it is clearly the province of the veterinary schools to send them away well accomplished for the future career that awaits them. An illustration is afforded, by some members of our profession, of what may be regarded as an axiom: that no section of men should be intrusted to make laws for their own governance, inasmuch as these members ask to be allowed to tyrannise over future candidates by excluding them, on the plea that the medical schools require preliminary education; while we refuse to follow their example on all the more essential matters. Many of the graduates in medicine are always to be found

about the medical hospitals, devoting more time to learning after they have fulfilled the law, in giving up four years to study and then obtaining their diploma, than the Royal College of Veterinary Surgeons demands altogether.

At a recent meeting and dinner of one of the provincial veterinary associations, I observe that a member rose and made a laudatory speech, as a compliment to the Principal of our oldest Veterinary College, because he, "the Principal," had been bold enough to go in for preliminary examinations, and had actually given the blow first, and the word afterwards, for he had sent two candidates away from the College, without admission, this session. The strange narrative has so far excited my curiosity, that I long to make acquaintance with these two distinguished individuals. Were they merely extemporised for the purpose of producing a little dust to throw in the associated members' eyes? Or were they blind, dumb, or could they have been the bearers of tickets-of-leave?

These questions are of moment, and the answers to them may prove relevant in forming a judgment on the matter.

If we are to have preliminary examinations forced prematurely upon us, let us, in the name of English fair play, have the formality of a by-law from the Council of the Royal College of Veterinary Surgeons, not to say some legislative enactment. What could the fathers of those two young men have said, in finding their sons sent away, snubbed, their *amour propre* and hopes destroyed by the arbitrary bidding of one individual?

Assuming the possible case of these men having reached the years of discretion, and to have earned the little packet of guineas which they took to invest in the acquisition of important knowledge; and suppose them to be told, "Oh no, go and hammer iron and cut and rasp horses' feet, you are no scholars." I hardly think that the two men would have been made of such sterling stuff as such test would imply, or else we should have learnt of their having taken legal advice, on being so peremptorily dismissed, before they bowed and backed out.

Let us have educated men to all available extent; and education freely worked out; we shall not attempt to prescribe the exact kind or quantity; but at least give us sound minds and bodies, the last strengthened by the performance of useful works, and the former untenanted by vicious thoughts and crotchets; and then if good practical veterinary surgeons are not formed, the fault will be with the schools.

Be the case as it may, since the act of summarily dismissing these men was unprecedented, and without, what sensible Englishmen would call, authority; it would have been well if the profession had been informed more about the matter.

Most fathers who send a son to the Veterinary College, provided with the necessary number of guineas to meet demands, and with a clean shirt and a blanket, would press for inquiry into causes, if their

son was refused admission; and if the case happened to be that of a young man subsisting on his own resources, coming with a light heart, and the money of his own earning, to buy the means of more knowledge, give such a man the cold shoulder, and send him away. I should think that once he had travelled all the way to London, he would tell the odd tale there.

While I am for enlarging the means of instruction, lengthening the time for study, and exacting the performance of alloted work from students, I am convinced that all interests will be best served, and veterinary science and art grow to more solid proportions, by allowing freedom for action, and relying on healthy competition and honourable rivalry amongst schools and pupils. Distinguishing, however, between freedom and neglect, I believe that energy and wise procedure should prevail in the Council of the Royal College of Veterinary Surgeons, which, if it lacks the powers to carry required measures of reform, should seek to obtain them.

The second section of my paper on some epochs in the History of the Veterinary Art is unavoidably postponed.

Cases and Observations on Extraction of the Calf in Breach Presentations by One Leg. By Mr. W. A. CARTWRIGHT, M.R.C.V.S., Whitchurch, Salop.

ABOUT one o'clock on Sunday morning, the 20th March 1865, I was called up to an aged cow that could not calve, belonging to Mrs Lewis, of Hadley, Marbury, Cheshire, and was informed it was a breach presentation. On my arrival, I found the cow had had several calves, and was in fair condition.

A person of the name of Jones, residing in the village of Marbury, and who in his younger days had been pretty clever at such work, had tried for several hours to extract the calf, but had only succeeded in getting one of the hind legs up. I found the other hind leg lying very low down under the calf's body, and I was not able to lay hold of the foot, or large pastern, so as to put a cord around the latter.

I then inserted a hook under the tendons just above the point of the os calcis, with the hope that I should draw the leg higher up so as to lay hold of the foot, but even then I could not reach the foot, as the point of the hook stuck under the partially expanded os uteri; but at length we got the hook into the passage, with the leg bent under the thigh, and in this position we removed the calf by pulling at the hock of one leg, and at the other leg.

The placenta immediately followed, and the cow *was soon* all right again.

Case 2.—On Sunday afternoon, the 3d of April 1865, I was sent for to the above farmhouse to another aged cow, from whom they could not extract the calf. On my arrival I found this also was a breach pre-

sentation, and the persons in attendance had not, in this case, even been enabled to get one of the hind legs up, but after a time I succeeded in getting one of the legs straight into the passage, but after trying every expedient, I was not enabled to get the other leg up.

I then began seriously to consider what next was to be done, and on thinking the matter over, I could see no reason why the calf would not come as easily away with the one leg under the belly as if it was straight out behind, and I then determined to see if such would not be the case; and after obtaining the necessary help of three men, I found that, on steadily and gently pulling at one leg, we were gradually succeeding, and ultimately we got the calf away without using greater force than if we had had both legs straight out. The placenta soon after followed, and the cow is doing well.

On the 15th April 1865, I had another breach case at an adjoining farmhouse, but as the calf was small and in a better position, I extracted it in about ten minutes.

Observations.—As I take very great interest in veterinary obstetricy, I should be glad if any other veterinary surgeon, who has had the opportunity of putting the practice of extracting by one hind leg to the test, would send to your journal any similar cases, either successful or otherwise; for I think if we can as easily extract in this position as in the other, it will both save us a great deal of trouble, and the animal a great deal of unnecessary pain; and, for my part, I see no reason at present why the calf should not come away with one leg under him as in both being straight out, as the stifle and thigh will lie in the flank and under the belly without impeding the extraction of the calf. Some may say that, by pulling only at one side of the fœtus, we cannot so easily extract it as by pulling at both legs, but of this I am rather doubtful, and am inclined to think, on the contrary, this position may actually be an advantage in pulling one side of the pelvis in advance of the other, so that the iliac projections should not be in opposition at the same time; and if we don't like to pull at one leg only, we can easily insert a hook under the skin of the rump on the other side so as to pull at this side also.

In the twenty-eighth volume of the "Veterinarian," p. 12, will be found a case of breach presentation recorded by me, when the cow expelled a larger calf by the breach only, and with both legs under its belly, and the cow and calf did well. The distension was enormous, and she expelled it without scarcely any assistance from me. In volumes xv., xix., xx., and others, of the "Veterinarian," your readers will find the subject of extraction in breach and other presentations pretty freely discussed by me.

In conclusion, I cannot but observe, that I do not think there is any subject more worthy the attention of veterinary students than the subject of veterinary obstetricy, as it is highly essential that every one intending to practice in a country district ought to be well grounded in this department especially.

Extraction of a Foal—Fore feet presented—Head back. By the same.

AT 7 a.m., on Friday, 21st April 1865, I was called in to a large cart mare, seven years old, the property of Mr Billington of this town, that could not foal. On my arrival I found the mare standing up, and two legs of the foal were presented; and on examination I ascertained that they were fore ones. In my exploration I found that I could also lay hold of the two hind feet, and which were within the pelvis. The head I could not find anywhere, and it was stretched back. After a little consideration I determined, now I had the opportunity, to pass cords around the hind legs just above the fetlock joints, and having done so, I pushed them back as well as I could, and then tried to find the head, but without avail. I next tried to push the fore legs back and draw the hinder ones forward, and extract by the breach, but I found I could not force the fore legs sufficiently back in consequence of the mare's excessive straining.

Having no alternative, I removed first one fore leg and then the other, in the usual way, at the shoulders.

We now drew the hind legs forward, and the remainder of the foal came away without any difficulty, and the placenta immediately followed.

I saw her afterwards in the course of the day, and I fancy she will do well. I have ascertained since, that some of the neighbours heard the mare groaning and knocking about in the course of the night, and I have no doubt, from her general appearance when I arrived, that she was foaling then.

I forgot to mention that the side of the face of the foal was curved and hollow on one side, with the nose bent inclining to the left side, produced by, no doubt, lying against some part of its body, and it must have been in this position for many months to produce the malformation.

Fractures of a Navicular Bone, following on protracted and a progressive diseased condition of the same, with altered condition of the Pedal Bone. By JOSEPH GAMGEE, Sen., Professor in the New Veterinary College.

To the Editor of the Edinburgh Veterinary Review.

ALDERSHOTT, *April* 7, 1865.

SIR,—In a letter which you published in your journal for May 1864, commenting on Professor Gamgee sen.'s paper, which appeared in the previous number, on chronic lameness of horses, I stated with regard to navicular disease, that "I do not expect to find absorption of the bone internally as the cause or first condition of the disease," to which

letter, Professor Gamgee appended some remarks, and also invited investigation, with the view of dispersing the fallacy of "old notions," which he gives me credit for holding conscientiously. At present I have not heard or read of any new notions, which appear to accord with facts to be observed in the diseased parts after death, or with the history and symptoms of a case during life; while I submit that my "old notions" do both. I therefore trust to be excused if I briefly revert to the subject. I have despatched a navicular bone, with the portion of the flexor tendon which passes under it, to the Professor's address, for his inspection and use. The specimen illustrates the disease as I believe it really exists in the majority of cases, viz., primarily in the flexor tendon, as it passes under or behind the navicular bone, although I think inflammation of the articular cartilage of the bone, or its lining synovial membrane, may, nay does, lead to that roughened warty appearance of the articular surface of the bone, sometimes found in this kind of lameness. In the specimen sent, the tendon at the surface next the bone presents the appearance of having been gnawed by mice; and was, I doubt not, the part first affected, which when sprained, having some fibres ruptured, as this tendon had, gives to my mind the reason why this disease proves so incurable. The tendon acts over a lever, and is lined by a vascular secreting membrane, which also connects it with the articular cartilage; hence every motion tends to keep up the inflammation in the tendon, and also to cause it to extend to other tissues, till the whole bursa becomes involved, and subsequently the bone also; but *first* at the surface, and that only after the articular cartilage has been affected. This is an old notion, but not the one Professor Gamgee ascribed to *all*, as neither contraction nor bruising, &c., enter into the question as causes of the disease. A horse may be sound one day, with a foot apparently healthy, and the next day lame from navicularthritis, never again to be sound. Such, in fact, was the case with the one from which the specimen was obtained. Contraction does not produce the disease, but it frequently follows it, as it does almost any chronic inflammation of the foot, and when present, causes absorption or wasting of the coffin and sometimes the navicular bone from pressure. Necessarily, as the box lessens, the contents must diminish in bulk; besides, a diseased part cannot perform perfectly the natural functions, which is probably another cause of wasting of these bones; but I distinguish between general wasting of a part, and ulceration of the same—one is diseased structure, the other diminished bulk. Professor Gamgee in his paper compares the ulceration on the surface of the navicular bone to a decayed tooth, and says in effect that it commences internally and extends towards the surface, till eventually the bone breaks in. Did he ever find true ulceration internally with a sound articular surface? If it occurs so, why call it atrophy or wasting? It would be simply caries extending from the centre—a very different condition to general wasting. Again, if it commences internally, as the Professor supposes, how is it that the ulceration does not show itself on the anterior articular surface? and why

does not the wasting of the coffin bone lead also to ulceration externally? Seeing, according to the Professor's views, it is the first affected, I should expect to find the ulceration most marked in it.—I have the honour to be, your obedient servant,

ALFRED J. OWLES,
Veterinary Surgeon, General Staff.

NEW VETERINARY COLLEGE, EDINBURGH,
8th April 1865.

DEAR SIR,—I beg to acknowledge receipt of a diseased specimen of navicular bone and section of tendon, which, with your letter, shall receive my best and early attention.

In tendering thanks, I feel doubtful whether, as an individual, I am entitled to express my opinion on the merits of the step you have taken, because I believe the question to be of so much importance, that every member who takes the same means as you are doing to arrive at definite knowledge on so important a subject, deserves the thanks of his brethren.

I should have been glad if you had sent me the pedal bones of the same foot; and one of the reasons for my writing thus early is, in the hope that you may not have made away with that bone, to ask you to forward it also, and, if possible, at same time to secure the other fore-foot of the same horse, and send it as well.

If you send those specimens, or either of them to me, I promise to afford you all the information that may be derived from their careful investigation.

I may tell you, though you will have gathered it from my writings, that for several years past I have been in the habit of examining the whole pedal region in these cases; and in order to include the entire knee-joint, I have a section made through the lower extremity of the radius; and but for such extensive research, thereby learning relations, I could not have made out much that will, with the aid of others, ere long become evident to all.—I am, dear sir, yours faithfully,

J. GAMGEE.

10th April 1865.

SIR,—I beg you will excuse the trouble I am giving, in my desire to render the specimen you sent me of the utmost possible use to veterinary science.

Since I wrote you on Saturday, I have examined the specimen; and now, if you can answer me the following questions, or some of them, the information afforded will be of importance:—

How old was the horse?

How was he bred?

How long had you known him?

Had he ever possessed free and good action in his trot since you knew him, or while in the possession of his last owner?

Had he ever been lame to your knowledge?

Did the horse feel infirm or unsafe to the rider of late?

What exertion was he undergoing when the accident happened which led to his destruction?—I am, sir, yours faithfully,

JOSEPH GAMGEE.

Mr Owles favoured me with the bone, and I received the following from him:—

ALDERSHOTT, 11*th April* 1865.

SIR,—In reply to the questions in your letter of yesterday, I have the pleasure to state that the horse was rising eight years; he was got by a thorough-bred horse,—I forget the size. I had known him about three years before his death in January; he had fair action, fine, but not high; he had never been lame during the time I knew him previously, and was not infirm; the cause of the lameness is not known, it was sudden. Subsequently to the lameness he had influenza badly, and rheumatism followed; the latter attacked both fore fetlocks. This complication of diseases reduced the animal and left him with diseased lungs and permanent lameness, which led to his being destroyed. The foot lameness commenced in June 1862; I did not see the case till two weeks after the attack—the symptoms were obscure, but indicated the foot as the seat of injury.—I am, yours faithfully,

ALFRED OWLES.

In a letter bearing date of the 15th, Mr Owles says, "The horse had never been lame since I knew him previous to June 1862, when the foot lameness commenced; and I did not see the case for two weeks after the attack, as I was on the march, but I heard of it immediately by letter."

REMARKS.

For the interesting specimen, an illustration of which is given further on, we are indebted to Mr Owles, Veterinary Surgeon to the General Staff at Aldershott, who has kindly supplied the history of the case, which will be found to head these observations. The navicular bone came to my hand through the post, on Saturday, April 8; it was carefully put up in dry tow and paper. On opening the parcel, same time reading the letter which accompanied it, I found some bloody exudation around the bone, and the tow adhering to it; I therefore placed it in a basin of water, in order to clear it of extraneous matter, and to examine it at leisure. In the meantime, I acknowledged receipt, and the same evening, after washing the bone, I looked at it with the attention such a specimen would at any time elicit from me. The first thing to be observed was a highly vascular state of the whole substance of the bone; and two depressions, when viewed from its lower and broad surface, were seen on the inferior anterior ledge, which, on closer inspection, proved to be two fractures; the commonly prevalent flattened surface of the bone

on its lower surface formed a characteristic feature of it, so much so that a deep depression in the bone is manifest over three-fourths of its long axis, passing through the natural prominent ridge over the lower and broad surface of the bone. Having made these observations I tied a thread round the bone, and hung it to the window curtain, in order to see its true character by daylight next morning; and accordingly, after a lapse of some eight hours, the bone being clean and dry, its pathological state could at once be seen. The membranous textures lining the bone having retracted by drying, left the fractured edges clearly defined through their whole extent, and I was able at this juncture to see how force had been exerted to produce the result, and that the urgent symptoms of lameness, which finally led to the destruction of the horse, must have been sudden in their appearance; yet, seeing the chronic diseased state, I cannot conceive that the horse could have moved freely during many of the latter months, or a year previous to the occurrence of fracture. I wrote to Mr Owles for more historical details, and am indebted to him for them, which will be found annexed, and also duly received the pedal bone, which appears to be of the near fore-foot of a well-bred horse, and is evidently that to which the fractured navicular bone belonged. I find the pedal bone wasted by absorption, both on its planta surface and around the lower circumference of its outer surface, giving to it a diminished form; which altered condition, I consider, must have deprived the horse of the capability of showing free, safe, and easy action. This pedal bone exhibits the signs of abnormal stress having been imposed on to it, over two aspects—firstly, the socket formation on either side, which receive the inner and outer condyles of the coronary bone, are depressed, having their margins thin, and bulging, showing that the weight was conveyed vertically on to it, and that the foot would have, when viewed from the pastern joint, an overshooting appearance.

The next aspect of the coffin bone, on which I shall remark, is that where the most injury had been sustained, and though not first in the order, became an additional cause of increased general derangement; I allude to the posterior and lower articulating surface of the coffin bone, where it articulates with the anterior aspect of the navicular bone—that part of the pedal bone contiguous to, and immediately above, the ledge of the navicular bone, which was fractured in two places.

I am now come to a part of my narrative where, with the commonly-accepted notions on the structures and functions of these parts, I fear I shall not easily make myself understood; yet the questions involved are of great importance, which require to be cleared up regarding the economy of the foot and diseases incidental to it. However far it may be from my wish to give a partial and incomplete description of my views on the function of structures under consideration, as it is the only way to treat the matter, since fuller details are incompatible with space, I adopt the alternative.

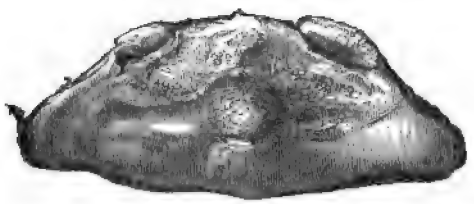
The navicular bone, which is oblong in shape, is placed transversely

behind the centre of the pedal bone, it has three lubricated surfaces, —the uppermost receives the posterior and lower part of the coronary bone, the upper and anterior articulates with a corresponding surface of the pedal bone, and the lower and backward aspect of the navicular bone forms the surface for the flexor pedal tendon to slide on. This bone is of about twice the substance and strength in the middle, where it has a twofold convexity, as seen above and below, to what it is on either side, midway between the centre and each extremity; which again are thickened and strong, with obvious adaptation for the hold of ligaments. The relative extent of the two large articulating surfaces of the navicular bone, bear proportion to each other of from two to three, or two to one greater on the lower aspect than that above, where it faces the coronary bone. The difference between the extent of the two surfaces is given by two ledges being extended from the body of the bone inferiorly, one anteriorly, which extends partly over a concavity of the pedal bone, and gives support and form for the tendon to rest and move on, and the other ledge extending along the posterior aspect of the bone, is short and dense, and is of about half the thickness of the body of the bone. The whole margin of this bone gives strong attaching surfaces to ligaments.

The accompanying illustration, which I republish from the *Review*, vol. iii., page 640, where I first demonstrated some of the most important connections and endowments of the navicular bone, exhibits a transverse section of the foot, the posterior region being removed, to show the ligament rising from the posterior ledge of the navicular bone, increased manifold in substance at each extremity, passes obliquely over either side of the coronary bone, upwards and forwards to the anterior and lower surface of the pastern bone, which latter is the shaft which acts on the navicular bone, the innermost nucleus of a system, these bones standing in relation to each other as pulley and fulcrum below, the pastern region constituting the leverage power.

Turning to the anterior aspect of the navicular bone, and viewing its lower surface, we find an advancing ledge giving attachment to the ligament which connects this to the pedal bone, not, as has been inferred, by a uniform flat ligament, but one whose power is mainly at the central point, where the navicular bone pushes forward like a ship's bow, having great substance there, in a medean line from front

backwards, (or, having regard to the oblique position of the bone normally, it would be about equally correct to say from below upwards.) From that anterior point a strong short ligament connects it to the inner inferior concavity of the pedal bone, the fibres of which ligament are mainly inserted directly into the latter; and part of them, the outermost, become blended with those of the perforans tendonæ, with which they are inserted. Thus the pedal bone at its central positions inferiorly, in its most concave recess, and where its strength converges, gives three insertions to structures, on the integrity and the economy of which depends the power of movement, and value for all purposes, of the horse. These insertions are, firstly, the main anterior ligament in the medean line of the navicular bone; secondly, the tendon of the flexor perforans; and thirdly, the strong tendinous frog. I need not trace these connections and the blending of functions further for my present object. The ligament which connects the navicular to the pedal bone is continuous with the central part described; and looking at the crescent-shaped front ledge, we find two other points of that bone pushing forward towards two prominent parts of the pedal bone; and at these points the connecting ligament has increase of strength, and it was at these two points where the two fractures in the specimen before us took place; they are on either side, equidistant from the strong central attachment.



Besides the attachment direct between the pedal and navicular bones, the latter is most strongly connected by ligaments from both its extremities, which are directly inserted on the inner surface of the lateral cartilage, where it is supported by the basilar process of the pedal bone on each side; and as the cartilage runs forward and is attached to the lower lateral surfaces of the coronary bone, and is connected with the anterior part of the pedal bone, we shall presently see how functions blend there to sustain force. Lastly, those ligaments from the ends of the navicular bone connect downwards and backwards with the cartilages and fibrous bands, all of which coalesce and constitute the substance and strength of the pliable region of the foot.

How did these fractures of the navicular bone happen? Why, in the same way as all fractures of that bone do happen, whether it occurs near one of its extremities, or, as in some cases of more advanced disease, in its centre—the locality depending on the relative weak part of the bone, and the way the force was applied on it. In

the case under notice the most prone points were those connected strongly to the pedal bone; at the connection of the navicular with the pedal bone the functions of the foot allow of limited relaxation when it is lifted, and corresponding slight recedence occurs from the connecting point of these bones. But as the foot is pressed down, when movement of the body is going on, the pressure of the coronary bone is great in proportion to the energy of the muscular force employed when the weight is passing over the point of resistance, at which instant the navicular bone is put to the test. Fixed by its front ligaments as well as laterally, and abutting against the posterior surface of the pedal bone, pressed up from behind by the flexor tendon, the pastern applies its leverage force; thus, all fast and beautifully harmonising below, nothing seen by man of creative mechanism equals this aspect of the horse's foot, with its cuplike concavity, formed by two bones, so connected as to receive the strong broad condyles of coronary bone, which of itself is playing physical parts beyond my power to estimate their force. It was by this antagonism of downward pressure anteriorly, and the upward action posteriorly, that the two points of the ledge of the navicular bone were fractured by virtue of its own connecting ligaments, being stronger than the bone itself at the part.

My concluding remarks on this instructing case shall be brief. When the horse was first known to be lame, with the remainder of the history of the case, will be best gathered from the account of the gentleman to whom we are indebted for the report. Though we have the pathological conditions of one fore-foot only, there is no ground for supposing that the other one was free from disease, and probably it was not exempt from some share of the recent injury, since many cases show that the feet often suffer in pairs, and sometimes three, and even all four give way under extraordinary efforts when fracture of one bone occurs under exertion. We see that Mr Owles speaks of the feet, and not of a foot, as the seat of lameness. He tells us that both pasterns were swollen, which was attributed to rheumatism; and that this was succeeded by influenza, and this latter by confirmed disease of the lungs and breaking up of the constitutional system.

My own opinion on this interesting case is, as far as opinion may be allowable on the basis of facts and concurring incidents, that a weakening and at length diseased process had long been in progress in both pedal and navicular bones, and that the fractures occurred through the natural powers of the horse being exerted on structures weakened and placed under physical disadvantages in relation to co-operating phenomena.

Instead of rheumatism, I believe that the swollen state of the pasterns was due to the fractured and complicated condition of bones and tissues below; and that in all probability with the bones loose, as the fractured parts remained without any sign of their union being in progress, that purulent affection of the blood followed, which ran its course in the way described, with the fatal consequences.

The Veterinary Review and Stockowners' Journal.

THE PROGRESS OF THE PROFESSION.

WHEN, in 1858, we published the first number of this Journal, one great motive which induced us to take the step, so shortly after establishing the new Veterinary College, was to advocate the combination of all veterinary practitioners into one body, with a liberal constitution, having full power over its governing council and examining boards, as secured to our profession by royal charter in 1844. Many have since been the efforts to bring such men as Professor Dick and Mr John Hall Maxwell to their senses on this question, but few in the south have known what essence of arrogance and obstinacy these two names represent—the one determined to crush every one, to have his own way in all that concerns veterinary teaching and examining in the north; and the other ready to do anything in support of tyrannical and oppresive rule;—gentle lambs these to be coaxed into good ways—to be reformed after a long career of evil-doing! What did they care if a small profession was split up into two halves, and if the students who went to England with these certificates were taunted and annoyed?

We have been told all along that Professor Dick had his students examined before the Highland Society's Board. Professor Dick has been represented as not being all-powerful with the unpaid examiners whom he chooses. He gives them a dinner, and formerly was liberal enough to invite the students to the entertainment, but of late has imposed a penalty which the students refuse to pay. They get off with a two-guinea fee for their examination, which, no doubt, covers the expenses incurred in parchment and paper. This irresponsible board has, however, been doing a little good duty. At the examinations during the past month, it rejected 7 out of 28 students. Out of the 21 which it passed, 3 were examined a second time. It is, be it remembered, the work done by Professor Dick's friends, for

Mr Maxwell told the gentlemen who dined with Professor Dick at the Waterloo Hotel, that "there had been often a deal of misapprehension as to the relations which existed between the Highland Society and the Edinburgh Veterinary College. Some thought that Professor Dick examined the pupils himself and passed them, while others believed that the Highland Society did the examination, and granted the students its own diploma. This, however, he was glad to say, was not the case."

We should not have noticed these matters but for the circumstance, that whilst fewer students are taking the so-called Highland Society's certificate, which Mr Maxwell tells us is not the Highland Society's, but Professor Dick's, a large number of members is annually admitted into the body of our legally-constituted profession. Many who were formerly contented with Mr Dick's certificate have gone to the expense of a journey to Edinburgh and London, to become properly qualified; and some who have written to the Professor for certificates, have received them in an envelope, with the ungracious and not very grammatical sentence of "fools and their money *is* soon parted," alluding, no doubt, to the fee payable for the only legal veterinary diploma in these realms.

If the Royal College has to congratulate itself on its present position, it certainly cannot thank Professor Dick, or Mr John Hall Maxwell; and as the new Veterinary College led to the reorganization of the Scotch branch, it has steadily enhanced the interests of the body corporate, and exposed the rottenness of a system which, for many years, did no small damage to the profession in North Britain. It is no meagre result to find the number of properly qualified members of our profession steadily increasing in the North; and we anticipate that what has not been accomplished by exhortation and earnest appeal to Professor Dick, has been attained by the strong hand of time, and the effect of rational advice with those who now seek to become veterinary practitioners.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF COUNCIL, APRIL 5, 1865.

Present—The President, Professors Spooner and Varnell, Messrs Broad, Ernes, Greaves, Harpley, Harrison, Helmore, Lawson, Robinson, Thacker, Wilkinson, and the Secretary.—The President in the chair.

The minutes of the preceding meeting were read and confirmed.

Letters were read which had been received from several gentlemen holding the Highland and Agricultural Society's certificate, who were desirous of becoming candidates for the diploma of the Royal College of Veterinary Surgeons at the next meeting of the Court of Examiners.

A letter was also read from Professor Syme, acknowledging his election, and accepting his appointment, to the Scotch section of the Board of Examiners; and one from Dr Struthers, on the subject of his re-election as Secretary to the Board.

The subject of the forthcoming examinations was then considered, when it was moved by Mr Ernes, and seconded by Mr Helmore,—

"That the London examinations take place April 24, and be continued on the 25th, 26th, and 27th."—Carried.

It was moved by Mr Wilkinson, and seconded by Mr Ernes,—

"That the Scotch examinations take place on April 24 and following days."—Carried.

The Registrar reported the following deaths,—viz., Mr Henry Hogreve, *half-pay* 15th Dragoons; diploma dated July 1, 1806. Mr Wm. Woodman, *half-pay*, 2d Dragoons; diploma dated June 30, 1812. Mr Sargeant T. Harman, Arundel, Sussex; diploma dated April 30, 1847. Mr Thos. Pengree Page, E.I.C., 19th Hussars; diploma dated June 28, 1836. Mr John Robinson, Lichfield, Stafford; diploma dated April 27, 1815. Mr William D. Lines, St John's Wood; diploma dated May 11, 1853. Mr James Buckeridge, Hungerford, Berks; diploma dated April 28, 1863; and Mr Charles C. Brett, *half-pay*, Cavalry Depôt, Maidstone; diploma dated April 1, 1828.

The Finance Committee reported that they had examined the vouchers and receipts of payment during the preceding quarter, which were found to be correct. They also submitted the quarterly balance-sheet of the Treasurer's account, from which it appeared that the liabilities, for the quarter ending April 1, amounted to £69, 6s. 11d. They recommended that these liabilities should be discharged.

It was moved by Mr Broad, and seconded by Mr Helmore, that the report be adopted.—Carried.

Cheques were ordered to be drawn for the current expenses.

The arrangements for the forthcoming annual meeting were next

considered, when it was moved by Mr Lawson, and seconded by Mr Robinson,—

"That Messrs Wilkinson, Ernes, Harpley, and the Secretary, be appointed the committee to prepare the annual report."—Carried.

It was moved by Mr Lawson, and seconded by Mr Greaves,—

"That Mr James Hall, and Mr Joseph Woodger, be appointed auditors."—Carried.

A discussion next took place relative to the anniversary dinner, when it was resolved,—"That the London Tavern be selected, and that the Council be the stewards."

It was moved by Mr Wilkinson, and seconded by Mr Greaves,—"That Messrs Silvester, Ernes, Harpley, and Thacker, constitute the dinner committee."—Carried.

The Secretary called the attention of the Council to the propriety of having additional advertisements inserted, viz., in the *Sporting Gazette* and the *Glasgow Herald*, which was agreed to,

By Order of the Council,

WM. HY. COATES, *Secretary*.

SPECIAL MEETING OF THE COUNCIL, HELD APRIL 19, 1865.

Present—The President, Professor Varnell; Messrs Brown, Ernes, Harpley, Harrison, Helmore, Moon, Thacker, Wilkinson, Withers, and the Secretary.—The President in the chair.

The minutes of the preceding meeting were read and confirmed.

A letter was read, which had been received from Dr Struthers, relative to an application for examination made by Mr Robert Park, a veterinary student of the Glasgow school, who submitted an attested list of medical certificates which he had received from the University of Glasgow, during a period of three years' attendance, as well as a certificate from Professor M'Call of the Glasgow Veterinary College, for the session 1864-5.

It was moved by Mr Wilkinson, and seconded by Mr Harpley,—

"That Mr Park be considered eligible for examination, and that a telegram be sent to Dr Struthers to that effect."—Carried.

A letter was also read from Mr Cowie, one of the members of the Court of Examiners acting for Scotland, relative to the meetings of the board in Edinburgh being held twice in one day on an emergency, and requesting to be informed whether in such a case the examiners would be entitled to double fees.

The subject was discussed at some length, and ultimately ordered to be adjourned for future consideration. The Secretary was requested in the meantime to communicate with Mr Cowie, and to ascertain from the medical examiners resident in Edinburgh whether it would be agreeable to them to attend two meetings in one day.

The annual abstract of the proceedings of the Council, as prepared

by the Report Committee, was then read, and submitted for approval, whereupon

It was moved by Mr Harrison, and seconded by Mr Ernes,—

"That the report be received and adopted."

The amended balance sheet of the receipts and expenditure during the past year, as audited, was laid on the table. After considerable discussion,

It was moved by Mr Thacker, and seconded by Professor Varnell,—

"That it be received and adopted."—Carried.

A cheque was ordered to be drawn for the examiners' fees.

By order of the Council,

WM. HY. COATES, *Secretary.*

PROGRAMME OF THE SECOND INTERNATIONAL CONGRESS OF VETERINARIANS,

TO BE HELD AT VIENNA, FROM THE 21ST TO THE 26TH AUGUST 1865.

THE International Congress of Veterinary Surgeons, which met in Hamburgh in 1863, on the invitation of Professors Gamgee of Edinburgh, and Hering of Stuttgart, resolved at its sitting on the 18th July, that the next Congress, now fixed for 1865, should take place at Vienna; and the Professors of the Imperial Veterinary College of Vienna, whose names are subjoined, and who were present at Hamburgh, were deputed to make the necessary preparations.

According to the desire expressed at the first Congress, the second should have been summoned for the time during which an extensive agricultural exhibition was to take place, but circumstances over which the Committee had no control have interfered with such an arrangement.

As for the Agricultural Show of 1866, proposed by the Imperial Agricultural Society of Vienna, the details and particulars have not yet been under consideration. Still therefore undecided, notwithstanding that gentlemen who wish to attend the Congress might have preferred the Exhibition period, the Committee has felt the necessity of taking the requisite steps to call the Congress together in 1865, without having regard to the contingency of an agricultural show.

By a supreme decision, His Imperial and Royal Apostolic Majesty has deigned to acquiesce in the holding of the International Congress of Veterinarians at Vienna in 1865.

The time most convenient for such a Congress seemed to the Committee to be near the end of the month of August, as at that season the holidays have commenced at all the Veterinary Colleges, and the

considered, when it was moved by Mr Lawson, and seconded by Mr Robinson,—

"That Messrs Wilkinson, Ernes, Harpley, and the Secretary, be appointed the committee to prepare the annual report."—Carried.

It was moved by Mr Lawson, and seconded by Mr Greaves,—

"That Mr James Hall, and Mr Joseph Woodger, be appointed auditors."—Carried.

A discussion next took place relative to the anniversary dinner, when it was resolved,—"That the London Tavern be selected, and that the Council be the stewards."

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The annual abstract of the [illegible]

Professors have a good opportunity of being present. Moreover, the season is propitious for those who have to travel from the North and East of Europe.

With the consent of the Imperial and Royal Ministry, the Committee have fixed the time for the Congress, from the 21st to the 26th of August, which, according to the time required for discussions, might be prolonged towards the end of the month.

The Imperial and Royal Academy of Sciences has kindly placed at the disposal of the Congress the accommodation required in its palace, No. 2 University Square, and one of the members of the Committee will have the honour to receive there, from and after the 18th of August, the gentlemen who intend taking part in the Congress.

The object, already known by the rules of the Hamburgh meeting, is to deal with veterinary questions having an international importance, to consider propositions bearing thereon, and submitting resolutions to all the governments.

The principal objects of discussion will be the means of communication in the propagation and the progress of epizootics from the various countries; the propositions, comprising common measures necessary to prevent the extension of and overcome these maladies, no less than the measures which concern the international commerce of the domestic animals. Generally speaking, all questions of veterinary science are dealt with which relate to sanitary or veterinary police.

The epizootics of special interest in different countries of Europe must be brought under the special notice of the Congress by attending members, with a view to securing a discussion on the most important points before the assembly.

The Committee has, with the consent of the Imperial and Royal Ministry of State, determined on proposing the following subjects for discussion :—

I. On the contagious typhus (Russian cattle plague) of horned cattle, with special reference to two points,—1*st*, The question raised in Hamburgh as to the number of days to which the period of quarantine for this disease, now extending to twenty-one days, may be restricted without inconvenience; 2*dly*, deliberation on common measures concerning the treatment of animals and animal products, in relation to international commerce, during the prevalence of the cattle plague in the country.

II. Discussions on the methods of disinfecting railway waggons, already required by several states, with a view to attain, if possible, to the realisation of this desideratum in a uniform manner, with due regard to the interests of trade, of veterinary police, and of the railway companies.

III. On rabies canina, which has attained an unusual extension of late years in Vienna, in other large cities, and in various parts of the country. A discussion on the causes of the malady, on the success of measures adopted up to the present time to prevent its propa-

gation, such as taxes, periodic examination of dogs, compelling the wearing of muzzles, &c., might, perhaps, lead to a plan whereby some reasonable regulation might be adopted for the supervision of dogs.

IV. Of late years several states have passed laws concerning the redhibitory diseases, or, at all events, deliberations have been made concerning defects, or certain morbid states to which this character might be attributed. A uniform law concerning the redhibitory vices would be of great importance to the international commerce in domestic animals. The opinion of the assembly on these defects might be of much value to legislation.

The Committee has the honour of inviting the professors of veterinary colleges, members of veterinary societies, veterinarians in all parts of Europe, and social economists, who take an interest in discussions such as are proposed, to participate in the forthcoming Congress at Vienna. The Committee also hopes that gentlemen intending to be present will signify the same to one of its members, who will have great pleasure in furnishing any information which may be required.

The Committee of the second International Veterinary Congress:
Dr Pillwax, Dr Röll, Dr Müller,
Professors of the Imperial and Royal Veterinary College in Vienna.

VIENNA, 30*th March* 1865.

PERISCOPE.

BRISTOL ASSIZE, WEDNESDAY AND THURSDAY, 6th AND 7th APRIL.
(*Before Mr Baron Channell.*)
BREACH OF WARRANTY—GREEN *v.* GROVES.

THIS action was brought to recover £81, 0s. 2d., for breach of warranty of 200 lambs. Counsel for the plaintiff, Mr Karslake, Q.C., and Mr Edlin; for the defendant, Mr Cole and Mr Collins.

Mr William Lewis, farmer, near Ilchester, was the first witness called, he swore that he was present when the plaintiff purchased the 200 lambs of the defendant, and that the defendant warranted the lambs "all perfectly sound." In cross-examination he admitted having heard the defendant say that if the plaintiff gave the lambs water after driving them, they would "run out."

Evidence was also led to show that the lambs were not mixed with others on their way to the plaintiff's premises.

Mr G. A. Whitemore, Shepton-Mallet, Somersetshire, was asked by Mr Green to examine one of the lambs which died. Its liver was diseased and contained three flukes. Is not quite sure whether flukes breed in the liver or not. Cross-examined—The lamb died from disease of the liver. One of the lobes of the liver was turned in its colour.

Professor Murray, Royal Agricultural College, Cirencester—Rot or coathe is a disease depending on the presence of flukes in the liver. The germs or pupa cysts are taken up by the sheep while feeding on the grass. They make their way through the stomach into the biliary ducts. The flukes develop there—cannot undertake to give an opinion as to the age of a fluke; would conjecture that a fluke attains its full size in from six weeks to two months. Their presence in the liver is injurious to the health of the sheep. They are injurious by taking up bile which should be applied to digestive purposes; and they are also prejudicial by pressing on the walls of the ducts, and thus producing structural disease of the liver. They do not breed in the liver, as their ova must pass out of the liver and undergo several changes of form before they are fitted to develop in the sheep's system. Wet warm weather favours the production of it. Cross-examined—One fluke would not kill a sheep; nor would two kill a sheep. The injury they produce depends on their number. Sheep are more liable to rot than other animals, because they are closer feeders. Flukes may develop in the livers of sheep in early spring, if at that season there is mild rainy weather. Ewes affected with rot could not be kept for the purpose of breeding. Re-examined—Rot is not a curable disease. Its progress may be retarded by giving nutritious food, but the sheep will ultimately die. Sheep fatten well in the early stage of rot; but when the liver becomes disorganised, they become emaciated and die. By Baron Channell—The presence of flukes in the liver has a tendency to weaken the animal; they will render it less able to resist depressing influences. In cold weather the germs of the fluke are shrivelled up and destroyed.

Mr Cole, for the defence, contended that there was no evidence of a breach of warranty in the case.

The Judge, however, ruled that there was such evidence. Mr Cole then addressed the jury.

Mr Charles North, veterinary surgeon, Cerne Abbas, Dorsetshire, was called by the defendant. He examined a lamb and found his liver healthy. Saw the liver of another lamb, which was also healthy. Did not think a dozen flukes in a sheep's liver would do it any harm. Does not consider it incurable. Never knew lambs to have rot. The flukes taken from the lamb which have been shown him are three weeks old. Cross-examined—Can tell the age of a fluke. A fluke attains it full size in from four to six weeks. Could cure it in the early stage when the flukes are not mature. They are not able to resist the effects of medicine then. They may be killed when they are three weeks old. Would ascertain that the flukes were of this age by the appearance of the sheep. Would give common salt and sulphate of iron. Was told that the second liver was that of one of the lambs about which there was a dispute.

Several other witnesses were called in support of the defendant's case, and Mr Karslake replied, after which the Court adjourned until ten o'clock next morning.

His Lordship occupied about two hours in summing up, after which the jury returned a verdict for the plaintiff for £81, 0s. 8d.

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE Members of the Lancashire Veterinary Medical Association held their tenth meeting, on the evening of the 1st of March, at the Brunswick Hotel, Piccadilly—The President in the chair. The President opened the meeting with a short address, and afterwards read a letter from the committee of the Royal Institution, in answer to a communication from him (the President) requesting permission from the said committee to allow the meetings of the above Association to be held in the theatre of the Institution, and it was thought this permission would be obtained before the next meeting. The President also read a letter from the Dean of Manchester, promising to do all he could to assist in promoting the scheme. A unanimous vote of thanks was accorded to Mr J. Greaves for his very handsome present to the Association, viz., a reading-desk, silk banner, and a framed portrait of Professor Charles Spooner. The following gentlemen were then elected members of the Association :—

	Proposed.	Seconded.
Mr Lawson,	Mr P. Taylor,	Mr J. Greaves.
„ Woods,	„ J. Greaves,	„ Haycock.
„ Billington,	„ Gibson,	„ Dixon.
„ Paulden,	„ J. Greaves,	„ J. Taylor.
„ Buckley,	„ J. Greaves,	„ J. Taylor.
„ A. Challoner,	„ J. Taylor,	„ J. Greaves.

Mr Heap was nominated by Mr J. Greaves.

It was then proposed by the President that the Rules should be read; but Mr Haycock moved an amendment to the effect that they should not be read, as there would be no time for discussion. Upon this being put to the meeting, the amendment was carried by a large majority. Mr Greaves intimated his intention of proposing an amendment to Rule 15 at next meeting, and Mr Haycock an amendment to the preamble. The Secretary then read the minutes of the last meeting, which, being duly confirmed, the President called upon Mr Brooks for his Essay on Laminitis. The subject elicited a warm discussion, which principally bore on the relation of laminitis to rheumatism. Several members entered into the discussion, and Mr J. Greaves read his thoughts on the subject. After which, the time being expired, the President proposed a vote of thanks to Mr Brooks for his paper, which was seconded by Mr J. Greaves, and unanimously accorded. The meeting then terminated. Mr J. Greaves being asked for a paper on the prevailing influenza, by the whole of the gentlemen present, kindly promised to write an essay on the subject for the next meeting.

Mr Greaves' Observations on Laminitis.

It is known to most of you that I have written upon this subject many years ago, and again lately, and that I entertain opinions upon it which differ from those generally received. It is reasonable to suppose that you will expect me, on the present occasion, to give a reason why I entertain these views. Veterinary surgeons, as a rule, do not publish their views to the world until they have carefully studied the subject they are writing upon. I have given to this question my best attention for over thirty years, having been in constant daily occupation during that period in a not inconsiderable practice. I have devoted much of my time in the sick-box by the side of my suffering patient, have watched closely the progress of the disease, have consulted every author upon the subject, and meditated upon it for whole nights, without a moment's sleep night after night, and the conclusions I have come to is that the disease called laminitis lacks several essential particulars or conditions which are ever present in acute inflammation.

The difference between my opinion and that generally received is, that the one ascribes it to acute inflammatory action affecting primarily, if not solely, the laminal tissues, whereas I consider that the pain emanates from the interior of the coffin bone and the dense nervous textures which invest that bone, that the laminal tissues are only secondarily affected, (they are simply implicated or involved in the general suffering,) and that the affection partakes much more of a rheumatic type or protracted cramp than actual inflammation, and would appear, in many cases, to be referable to hereditary causes.

I base my opinion upon two points mainly. The first is, that it is contrary to all experience that intense inflammatory action can be developed instantaneously, as laminitis can be and often is. Now, in inflammation proper there must exist certain

phenomena. You may search throughout all human and veterinary records, and you will search in vain for a single example of true inflammation being fully developed instantaneously. Spasm sometimes attacks with intensity, but always suddenly, inflammation never. Multitudes of examples might be adduced as illustrations of this truth; therefore I say, to call this instantaneous pain in the feet inflammation, whether that pain is the result of metastasis or from whatever cause it may be, and however intense it may be for the time being, is, I contend, calling it by an incorrect term. Acute founder, or fever in the feet, is an infinitely more proper term, or even peditis, (Professor Dick's term,) than laminitis.

The second point from which I draw my inference is, that the effects which we know must follow protracted intense inflammation do not attend or follow laminitis. If severe and protracted laminitis be true inflammation, then suppuration, destruction of tissue, gangrene, and decay of laminal tissue must follow, as an inevitable and unavoidable consequence. There is no plan of treatment you could adopt could possibly prevent it. It must unquestionably be attended by the same laws, and be followed by the same results, which inseparably belong to inflammation, but which results *we never* have in laminitis, however intense and protracted the pain may have been. I give this as my deliberate opinion after much serious and earnest consideration.

I am well aware that authors and lecturers teach us that spasm can exist only where there is muscular fibre. Of this I am not so very sure; but of one thing I am convinced that an intense pain may be instantaneously developed in which inflammation, as at present understood, is not an element, and where muscular fibre does not exist, at least not that we are aware of. I look upon what is generally understood by the term laminitis to be an affection of the feet hitherto undefined, a condition yet to be ascertained—it has no name in our nomenclature. I believe it to affect primarily the cellular membrane and nerve-fibre which enters into the composition of the internal structure of the bone and its dense coverings, that the affection is dependent upon the feet and the system generally being in a peculiar condition favourable to the disease at the time the attack takes place,—a wondrous sympathy is developed by community of tissue,—there may be a preponderance of lactic acid, or uric acid, or some other morbid, irritable state of body, or a preponderance of phosphate of lime, or animal matter in the bone itself. These conditions to some extent emanate from derangement of the digestive organs, and may be in operation separately or simultaneously, (this may have been going on some time before and preparatory to the acute attack.) An element is generated or roused in the system, —call it igneous element or calorescence—for a moment it poises itself, and then it is irresistibly attracted to these tissues.

> "The obedient steel with living instinct moves,
> And veers for ever to the pole it loves."

Something of the nature of a positive and negative electrical state, a current, is transmitted through the electrical wires, which creates incipient tumult or local irritation in the bone, and which is attended with instant and intense suffering. I use the term electrical, it being a definition the nearest approach to what I mean. I am anxious to reason this question as clearly as I can. I am persuaded the time will come when it will be found this is not merely speculative. I will advance some illustrations as practical proofs of this nerve-force. In forty-nine cases out of fifty where neurotomy has been performed for chronic lameness, say navicular disease, the operation may be performed with impunity, and, unless some puncture or bruise of the sensitive parts takes place, there is no fear of sloughing of the hoofs. But what is the effect if you operate whilst the foot is under this electrical influence? I beg to call your particular attention to this point, since I have taken great pains to clear the point up. Whether the case be one of old-standing or recent laminitis, you will find that the adhesion or bond of union between the sensitive and insensitive laminæ is immediately destroyed after the operation. These laminæ appear to quit or leave each other and become detached, as if an electric affinity had been suddenly withdrawn, and in a few days the hoof slips off. The sensitive laminæ continue alive and vascular during this process. Perhaps you are ready to reply, This can be easily explained on the principle that the horse, experiencing an instant relief from all pain, places the whole of his weight upon his feet; the attachment between the laminæ, having become greatly weakened by recent acute disease, at once yields; that the separation is the result of ruptured and torn attachments. But I am convinced this is not so. Their separation is dependent upon, and is the result of, sheer inability to hold together. The cohesive affinity or mystic power which held their

serrated edges together before no longer exists. Now, this is a fact; what is the deduction?

Further, if you fire a horse's feet, or blister a horse's feet severely, after unnerving, you will have deep sloughing, and a hundred to one but you have sloughing of the hoofs also. I have witnessed these phenomena over and over again; and again ask, What is the deduction? It appears to me that it is dependent upon some agent or element analogous to, if not identical in principle with, the disconnecting of the conductor in an electrical machine. I am convinced of this element in the animal economy, and that it plays an important part in the functions of vitality. I have met with men who appear unaccustomed to inductive reasoning, who seem incapable of deep, concentrated thought for five consecutive minutes, prefer to pooh-pooh this idea rather than examine it. They have never examined the cause of animal heat, nor mastered the problem of how fever heat is generated, or what the increase of temperature under inflammation is dependent upon. They may tell me it is dependent upon chemical action, or combustion in the capillaries and air cells, but they seem unaware that some of the most profound thinkers of the present age have, during moments of their clearest, most lucid intuition, caught a glimpse of the fact that there is another element existing in the production of this phenomenon, an element apart from and wholly independent of this combustion theory.

But what does practice teach us upon this point? I wish to address you as practical and scientific men. What conclusions can we arrive at when we find one eminent man asseverate, that his success in these cases is attributable to prompt and effectual blood-letting, and that operation performed over and over again; another practitioner, of even longer experience, asseverates that his success in these cases is attributable to never bleeding at all, even in the worst of cases? Now, gentlemen, we are dealing with one of those questions in which *both cannot be right.* Again, we find many eminent practitioners strongly advocate the removal at once of all weight from off the parts, and place the laminæ and the feet in a state of complete rest. This method is prompted, to all appearance, by scientific and humane considerations; but we find other practitioners, equally eminent, as strongly advocate thin-heeled shoes and compulsory exertion. We are assured that both these systems are attended with more or less success; but we are again dealing with one of those questions in which *both cannot be right.* Again, I ask a number of eminent practitioners, "To what do they attribute the cause of the throbbing of the planta arteries in laminitis?" They answer me at once, and unhesitatingly, "It is in consequence of the blood meeting with an obstruction in its transit through the foot." I ask the same gentlemen, "To what they attribute the cause of the extreme small feeble pulse in influenza?" They answer at once, and unhesitatingly, "To the general congestion of the capillary system." Here again, gentlemen, we are confronted with an incongruity; we are dealing with one of those questions in which *both cannot be right;* and what a labyrinth we get into if we dare to deviate from the trodden path, and ascertain where the truth lies! The fact is, gentlemen, we may depend upon it, that in many of these cases, as in other diseases, nature has been the grand restorer; that she has very frequently had to work the cure single-handed, if not in the very face of difficulties which our limited knowledge has been unwittingly placing in her way. I consider it would be a burlesque upon common sense, it would be stultifying true principle, to admit that the very opposite plans of treatment are producing the same effects. What does every-day experience teach us? It teaches us this lesson, at all events, that we may bleed in severe cases of laminitis whenever we like, to syncope, if we choose; in half an hour after such bleeding, the artery is throbbing again as hard as before; we may bleed again and again, and yet again; drain the system to exhaustion, at a fearful expense of vitality, but the artery is rebellious still.

Now I believe this state of things is not dependent upon congestion or inflammation at all. I do not believe there is a particle more blood sent to the feet in laminitis than there is at any other time; and further, that the throbbing of the artery is solely and entirely referable to a peculiar action in the artery itself, and it receives its stimulus from the peculiar electrical condition of the parts. Some cases in which I have bled most promptly and most effectually have done the worst; others, in which I have not bled at all, have recovered. The exudation or effusion which occasionally takes place in the sole, I consider of very light importance. Post-mortem examinations have led me to the conclusion that the disease partakes of rheumatism, and not inflammation; that it is precisely similar in its nature to that troublesome and most painful affection which occasionally attacks the white fibrous tissues behind the fetlocks. Professor Spooner does not believe it to be inflammation. Professor Bar-

low, who was one of the brightest ornaments of the profession in his day, considered it community of disease through community of tissue. But I have a strong faith, as science advances, and the true physiology of this affection becomes better understood, it will be found that the true cure will differ in many essential particulars from that hitherto adopted, and it will be something simple and decisive.

In reply to several questions put by Mr John Greaves of Altrincham, as to what plan of treatment he most recommended, Mr Greaves said, in all severe cases he strongly advocated prompt and copious bleeding from the arm, mild doses of opening medicine; take the shoes off at once, and leave them off, but do not touch the soles; put the feet in poultices; allow a large quantity of soft litter to remain underneath the feet; if there is much lameness, by all means throw him down at the first visit. This is easily managed when you have got into the knack, and the horse comprehends what you are about. You may bleed in the sole, if properly done, with impunity, and often with much benefit. As to after-treatment,—nitrate of potass, ½ oz.; extract of belladonna, 2 drams twice a day; or bi-carbonate of potass, ½ oz. twice a day for some time; or Fleming's tincture of aconite, in 10-drop doses, every six hours. But he confessed he had but little faith in any known medicine as after-treatment, in changing the natural tendency in the system, if a hereditary predisposition existed in the constitution.

THE MANAGEMENT OF GRASS LAND.

(*From the Journal of the Farmers' Club.*)

THE monthly meeting of this Club took place on Monday evening, April 3, at the temporary Club-rooms, Robert Street, Adelphi. The subject appointed for consideration was "The Management of Grass Lands," the introducer being Professor Coleman.

The CHAIRMAN, Mr R. Leeds, of West Lexham, Brandon, Norfolk, in opening the proceedings, said:—The gentleman who was about to address them might be regarded as embodying in his own person that combination of practice with science of which they heard so much in the present day. If he were correctly informed, Professor Coleman took a very good degree at their chief agricultural university—he meant the Cirencester College, where he afterwards continued for some time to manage the college farm. That was the right way of turning his tuition to good account. The county from which he (the Chairman) came was not looked upon as a grass county, but he believed the members of that Club generally would feel an interest in a discussion which had for its object an improved management of grass land, especially considering the extremely low prices of corn, and the high prices of meat which had prevailed for the last three or four years. He believed that was not the first occasion on which that subject had been introduced for discussion, either directly or indirectly. If his memory served him rightly, four or five years ago, Mr Owen Wallis brought under consideration the best plan of feeding off grass lands during the spring, summer, and autumn months. The wording of the question on the card that evening took a much wider range; and without attempting to anticipate the Professor's remarks, he would now call upon the Professor to introduce the subject.

Professor COLEMAN said:—Mr Chairman and Gentlemen,—The subject which I have undertaken to introduce for discussion this evening is one of great importance to the agricultural interests at the present time, since it affects the great question of live stock. The subject is so comprehensive, embracing such a variety of points, that in the short hour allotted me I can only hope to point out a few of its more salient features; and, first, allow me to explain that I do not claim any novelty in the matter I shall bring before you. I have no pet theory to develop by which grass land may be doubled in value, and great returns expected; and even if I had any particular practice of my own to describe, I should feel that the Central Farmers' Club was hardly the arena for discussing local practices, depending, as they usually do, upon peculiarities of soil, climate, &c. My object is to show that grass land is very grateful for liberal treatment, that our pastures require cultivation and attention just as much as our arable land, since the one is no more a natural condition than the other, though from the general practice we should conclude that farmers consider grass as requiring no sort of care—that our pasture cultivation is, as a rule, far behind the arable manage-

ment, and to point out how short-sighted and unprofitable is the system of mowing and grazing year after year, drawing from the soil its most valuable ingredients, until at length the sward becomes thoroughly worn out. In the continued production of our pastures that have been utterly neglected, we have a proof of the economy of nature and the almost inexhaustible supply of plant food in our soils. We all know the result of cropping arable land without returning periodically as manure the materials extracted by the crop. Yet the arable land is enriched by constant exposure to the atmosphere—or rather, fresh stores of food are eliminated—and is thus placed in more favourable conditions than our grass land. And, lastly, I hope to show that grass land will give a good return for outlay. The subject divides itself into the following heads:—1st, Is it desirable to materially increase the proportion of grass land? 2d, How can we best produce a pasture? 3d, Improvement of worn-out and neglected pastures; 4th, Value of irrigation by water and sewage.

I.—Is it desirable to materially increase the proportion of grass land?

At the present time we are constantly met by the assertion that land should go down to grass. Those who know nothing of practical matters seem to look upon this as the panacea for all our difficulties. Stock is high, and likely to maintain high rates. Corn, on the other hand, is low; therefore grow grass. And so, with a dash of the pen as it were, and a shrug of the shoulders at our dull stupidity in not at once seeing the necessity for altering our practice, the question is settled. A nobleman, who takes a lively interest in agriculture, but, like many others, has a theoretical rather than a practical acquaintance with the subject, lately fell into conversation with a large Lincolnshire farmer. "Ah," said he, "you are all wrong in Lincolnshire; you should lay all your land down to grass." The gentleman to whom this remark was addressed soon proved that Lincolnshire was growing more beef, mutton, and wool now than would be possible if his idea could be carried out, and giving us a vast bulk of corn into the bargain, in the production of which a thriving population was very profitably employed, and added his opinion that the present prices of corn and horn would have comparatively no effect upon the increase of grass, but might prevent our churchyards being ploughed up. There may be, and doubtless are, instances where the land is strong, expensive to cultivate, and the climate moist and backward, where the return to pasture may be desirable; but even in such cases we must have a considerable proportion of arable land, in order to winter our stock and make the most of our grass land. So that the loose way in which ignorant people talk is amusing, and at times irritating; indeed, every one fancies he can give some advice to the farmer, who is considered rather slow, and all the better for a little jogging. And if the change from arable to grass was as easy to carry out as to talk about, many might be induced to increase the proportion, though we should much doubt their wisdom in so doing. But it is a slow and expensive process, and very little return can be obtained for some years, and in many cases a man loses valuations he would be entitled to on giving up his occupation. I cannot help giving the testimony of a celebrated short-horn breeder, whose farm consists of two-thirds pasture. He told me if he had double the arable land he could winter a greatly-increased stock; as it was, he gave his neighbours £2 an acre for barley straw, and carted it, and could not get enough, and that it was utterly ridiculous to talk of laying down more land to grass. It certainly would be in his case, as he has too much already; but there may be instances of land broken up from pasture in consequence of the high price of corn, that may advantageously go back to grass; but except in the case of very rich land, as the alluvial soils resting on clay, such as the grazing lands of Leicestershire, accompanied, as they often are, with flooded meadows that produce a great bulk of coarse hay, grass land *cannot* be worked to advantage without at least an equal quantity, and more often two-thirds, of arable, to grow fodder and litter.

II.—How to produce a pasture.

First, select a proper mixture and sufficient quantity of good seeds. This can only be obtained by going to a respectable seedsman, and paying a full price. Professor Buckman's investigations proved that a frightful amount of dirt, weeds, &c., was often introduced into our fields with bad seeds—also that in many instances a large per-centage did not grow. The unfortunate weakness of farmers for a cheap article is well known. They are captivated by a low price—saving a few shillings per acre, eventually to lose pounds. We should have a due mixture of graminaceous and leguminous plants, varying slightly according to the kind of soil. Thus in the case of good loams, soils containing a due admixture of sand and clay, and land that is na-

turally kind for grass, we may sow grasses of a highly nutritive character, such as meadow fox-tail (Alopecurus pratensis), cat's-tail or timothy (Phleum pratensis), and cocksfoot (Dactylis glomerata); with these, which are all large-producing grasses, we may add meadow-grass (Poa pratensis), sweet-smelling vernal-grass (Anthoxanthum odoratum), which flavours the hay, perennial rye-grass, and common red and Dutch clover. In varying from the above for poor stiff clays, we may alter the quantities rather than the kinds of grass; perhaps the introduction of rough meadow-grass (Poa trivialis) and the lolium fescue (Festuca loliacea) may be desirable, using more rye-grass and common clover, and a smaller proportion of the more nutritive grasses. For thin soils on limestone, which are generally undesirable as permanent pasture, or at any rate not suitable for mowing purposes, we may introduce sheep's fescue (Festuca ovina), a small-leaved sweet grass, which forms a large proportion of the sweet down pastures, and is most valuable as a pasture grass. Yellow oat-grass (Avena flavescens) and soft oat-grass, both poor quality, may be added in small quantities. Yarrow (Achillea millefolia) and the yellow vetchling may be sown in addition to common and Dutch clovers. Lastly, for sandy soils, which again are seldom adapted for grass, we may leave out the richer grasses altogether, as they will not stand, and use a large quantity of common rye-grass, smooth-meadow and hard-fescue grasses, with a smaller quantity of soft-oat grass and sweet-vernal grass, filled up with a greater variety of clovers, using the zigzag clover principally, which appears natural to sandy soils, and adding bird's-foot, trefoil, and yarrow. For details as to the exact quantities to be sown in each case, I would refer to Professor Buckman's very useful work on "How to Grow Good Grasses," published by Robert Hardwicke, 192 Piccadilly. The next point for consideration is the question of laying down "with or without a crop." Some discussion appeared on this subject in our agricultural papers last autumn, and even got into the *Times*. The different opinions expressed were attributable to the different conditions under which experience had been gained. Thus in the southern and eastern parts of England, the young seeds, especially on clay, if sown without a corn crop, would frequently get scorched by the hot summer's sun; whereas in the moister districts of the north and west, and upon more friable soils, the seeds grow fast, soon cover the ground, and do much better without a crop, which only draws them up, as well as exhausts the surface soil. Having been much struck with the appearance of the young pastures on Mr Henry Howard's property at Greystoke, Cumberland—where a large park of naturally rough land was gradually reclaimed by breaking up forty or fifty acres at a time, taking one or two crops just to clean the surface and allow the vegetable matters to rot—I have received a very full account of the process from Mr Barker, the highly-respected agent, and cannot do better than read it *verbatim* to the Club. Mr Barker says:—"I shall follow the order indicated by you. 1. *The soil:* Soils of various qualities have been treated—sandy clay, and moorish soils on a clay, and sandy clay subsoil; red loam on limestone and red loam on freestone; soft spungy clays and hard gravels. 2. *The mode of breaking up the old sward:* Paring and burning were resorted to—on some rough heathy land at first; but latterly the first operation has been simply ploughing out with two horses abreast, excepting the land was very rough with ling or rushes, and then these were mown off before ploughing. The land so ploughed (begun in October and carried on to be finished by January if possible) was sown with oats, generally black Tartarian, and manured with from 2 to 3 cwt. of Peruvian guano. 3. *Course of Crops:* Oats as above, the first year. Second year—Turnips, with a mixture of bones and guano, the turnips chiefly eaten on the ground. Third year, if the land appeared in sufficiently enriched or unbroken, another crop of turnips as before; if considered in a proper state, then the land well scarified and worked, and about the latter end of May or beginning of June sown with rape and grass seeds, and a little guano. In the spring of the year, either preceding the turnip crop or before sowing down, the land received a good liming, say 150 or 160 bushels to the acre. I have never in practice found any prejudicial effect or loss from applying lime and guano in the same year, but rather the contrary. If the ammonia is set free by the lime, I think the soil catches it. 4. *The Mixture of Seeds:* The following may be taken as an average, but different soils had different quantities:—5 lb. rape, 5 lb. cow-grass, 5 lb. white clover, 2 lb. red clover, 2 lb. alsike clover, 2 lb. meadow foxtail, 1 lb. crested dogstail, 2 quarts meadow fescue, 8 quarts Italian rye-grass, 8 quarts Pacey's rye-grass, 8 quarts Stickney's rye-grass, 2 quarts cocksfoot. 5. *Period at which First Fed:* Generally in August. The field sown is always divided by hurdles into three or four divisions, and these are fed in rotation, not allowing them to get too bare. The stock in the first year always sheep, which fatten with sur-

prising rapidity. The rape affords shelter to the young seeds, and the additional feed gives increased droppings on the land and increased fertility. 6. *Future Management; and Manures, if any:* The second year a part is generally cut for hay, mown early, about 4th to 8th of June, and a luxuriant fog follows. The part pastured is fed by a mixed stock of horses, cattle, and sheep, and so on from year to year. If judiciously stocked and attended to, the pasture becomes in the second or third year like old good pasture land, and will continue so. Land managed as above twenty years ago is now still fine pasture. You will observe that all wet land is first drained either before the first plougher out or in the stubble. As to improvement in value, the land has been advanced from 100 to 500 per cent. We took into our hands about 100 acres from a farm that had been ploughed and mismanaged; the farmer was glad to get quit of it at 3s. 6d. per acre. After undergoing the above course of treatment, and after we had three years of the first grass, the farmer was pleased to have it again at 25s. per acre, and it is now far cheaper to him than when he paid 3s. 6d. Such is Mr Barker's description of a practice which from personal observation I know to have been most profitable, and which I consider so valuable as to need no apology for introducing. In the southern counties, as I said before, his plan would not always, or perhaps generally, answer; and we have the choice of spring corn or wheat. The latter is often the best crop to sow in, but it comes at the end instead of the beginning of a rotation, when the land is often not so clean as it should be. Where, however, wheat follows the fallow, I should recommend laying down with it in preference to either barley or oats; and for this reason, that the seeds would have more air and light, and be less drawn up; the surface firmer; and the seeds, if kept near the top, would vegetate better. Moreover, if the wheat is tolerably high, the seed will vegetate without requiring either harrowing or rolling; and this is a point of more importance than is at first supposed, for small seeds require to be as near the surface as possible, and too often rolling and harrowing puts much of them too deep to vegetate at all. This was alluded to by Mr John Grey, in an address to the Hexham Farmers' Club, when he called attention to some experiments made many years since for the Highland Society, and recorded in Morton's Cyclopædia. Fine soil was sifted, and put into boxes in which grooves could be made to any desired depth. Grooves were made of a ¼-in., ½-in., 1 in., 1½-in., and 2 inches, and seeds sown in each. It was only in the ¼-in. depth that any quantity of the seeds came up; about half the seeds were lost in the ½-in. groove, and at 1 in. hardly any penetrated. And, adds Mr Grey, "What was to become of those small seeds if they were thrown upon clods, and a heavy roller passed over them afterwards? No doubt one-half of them would be lost sight of altogether; and if they wanted permanent pasture they must be at the pains to make their mould as fine as possible, rolling the surface, and, having sown the seeds, covering them as gently and lightly as possible with a light harrow—doing it, in fact, as carefully as a gardener did with his light rake. Without that, they would very likely see only one-half their seeds have any produce." These experiments partly explain how it is that so little seed often vegetates. Where we sow-in barley or oats, I think it is a good plan to sow when the barley is up, first rolling, then lightly harrowing, and after seeds are sown, roll again. Having secured a plant, we have next to consider how to manage it. Hard stocking with sheep will not do, as they eat the heart of the clover, which invariably dies. We have seen that with rape sheep may safely graze in the autumn; but after corn it is best not to graze at all, but simply to consolidate the surface by heavy rolling. In some instances, it answers to mow a light crop the first year, cutting early, just as the grasses are coming into flower—either this, or rapid folding over with sheep. By these means we encourage the roots to spread out; and if the surface is well rolled after mowing, and a moderate coat of rather rotten manure or manures and soil applied during autumn or winter, it will do very well. The third year we shall usually notice a falling off, this being the intermediate stage between the artificial and the permanent condition. Some of the grasses we have sown are dying out, and those that have got a hold are hardly established. A few more seeds may be bushed in, and a dressing of farmyard manure and artificials applied; indeed, the better we do the land, the sooner will a permanent sward be established. One thing we must not do, and that is, stock hard with sheep running at large, as the clover and fine grasses will be injured by continual gnawing; whereas, if lightly folded over, the sheep eat it off at once, and little or no harm is done.

III.—Improvement of worn-out and neglected pastures.

The first point is to remove superfluous water. We cannot grow nutritious grasses

so long as the soil is saturated with moisture. We may have, it is true, a considerable bulk of watery bad herbage, and it is this fact that has led to an idea that grass land does not want drainage so much as arable; indeed, in some instances it has been said that drainage has injured grass land. This I deny as regards clay. Instances may occur in which drainage does no good—where the subsoil is gravel, for instance, and where the moisture which found its way along the porous beds from higher land may have actually nourished, and only been in excess at rare intervals; for, be it remembered, such water is not necessarily stagnant: it may fertilise and pass on, and so after a time escape. Now, close draining in such a case, by cutting off the water before it reaches the roots, may do harm, and I have heard of cases where this was so apparent that the drains were blocked up again. Draining alone will not *renovate* a worn-out pasture, as *too often* people appear to imagine it should do: the coarse grasses which have taken possession of the ground, and driven out or dwarfed the better sorts, die out when the water goes; the soil contains little available food; the atmosphere has not been able to circulate and act upon the minerals; and consequently, if draining is not followed by liberal treatment, the produce, at any rate for a time, falls off, and the farmer who may have looked upon drainage as the only necessity is disgusted to find he has less grass than before, and perhaps jumps to a too hasty conclusion that the drainage was a mistake. An anecdote told me by a Cumberland landlord corroborated this. His father was anxious to drain a field which was very wet; the tenant strongly objected; but as the landlord was willing to pay cost, and was continually urging the advantage, a reluctant consent was given. The drainage was well done, and much water ran through the pipes. About a year after the operation the parties met. "Well, Mr Smith, how does the drainage answer?" "Oh, confound the drainage! I wish I had never seen a pipe on the place; why, before I could never keep the grass down, and the cattle always had a good bite, and now it is as bare as a board." Two reasons might be given for this—actually less grass grew, the better sorts requiring encouragement; and the cattle found the herbage so sweet and good that they ate it down close, which they objected to do when it was coarse and sour. Every one must have noticed that in a field partly wet and partly dry sheep will gnaw up the herbage very bare on the dry land, and leave it in bunches where it is wet. The fact was really a satisfactory proof of the success of the drainage. Another idea was and is commonly entertained, viz., that grass land does not require such complete drainage as arable, and that shallower drains at wider intervals will answer. The frequency and direction of the drains depend upon the comparative porosity or stubbornness of the subsoil; but if we have similar soil we must drain as thoroughly on grass as on arable. Whilst on this subject, I cannot refrain from alluding to the porous and impervious beds which are so frequently found side by side in a direction N.E. and S.W. I have seen them very commonly on the oolite formations and in other places, and some people believe they always exist more or less. I would recommend all who are laying out money in this expensive operation to first carefully examine the soil and subsoil by digging a few trial holes before deciding on the plan; for wherever we have these porous banks, a few drains at wide intervals cut due N. and S. will remove the water more completely than an elaborate arrangement of drains cut merely in reference to the surface. The importance of getting out the water is shown by the improved health of stock; in one way or another many of the most fatal diseases to which sheep and cattle are liable may be attributed to the unhealthy nature of the food, and stagnant water is one principal cause of bad grass. The investigations made by Dr Voelcker into the causes of the peculiar scouring lands of central Somerset have thrown much light upon this interesting subject. It seems that the scour is caused partly by a too rapid growth of grass and its consumption, either green or converted into hay whilst in an unripe state—that is whilst containing an excess of saline and nitrogenous ingredients, and a lack of sugar. This we may believe to be often the case in imperfectly-drained pastures; such land is naturally cold and backward. There is no early growth as summer comes on, and especially if it prove a dry, warm summer, growth becomes very rapid, the plant finds an excess of mineral matter ready for use, and grows rank and unhealthy. The appearance in certain districts, on good land, of splenic apoplexy during last autumn, leads me more particularly to dwell on this point. After a very dry summer, during which very little growth took place, warm growing showers caused a rapid growth; the plant found in the soil an excess of mineral matters; the animal, eating such rapidly-formed and raw food, was affected, the blood rendered viscid, and inflammation of the spleen ensued. We can also, I think, understand the beneficial effects of salting the land as an antidote for this fearful disease—viz., that it tends to check vegetation. It may

be thought that I am going too far when I say that I attribute the losses occurring in certain seasons from liver-rot almost entirely to the unhealthy state of the grass, causing a derangement of the system, and especially the liver. It may be argued that the fluke which generally though not invariably pervades the liver is a sufficient cause; but why then is it only in peculiar seasons, unfavourable to the growth of healthy food, that this pest affects animals on undrained or badly-drained pastures, or at any rate that the disease is aggravated tenfold? We are told that the cists are taken in by the sheep from water, and are so plentiful in our ponds at a certain season that they must be imbibed. How is it that sheep escape? Surely the presence of the fluke in an active state is the result rather than the cause of a diseased condition of the organ, just as the fungus known as mildew on wheat is the effect of an unhealthy state of the plant. Improve the quality of the herbage, render it sweet and wholesome, and rot disappears. As two instances of very fatal diseases which arise from unhealthy grass, I may mention black-leg and red-water. Many years since I had an opportunity of seeing something of black-leg. It invariably attacked animals grazing on some peaty, swampy pastures, and disappeared when the same were thoroughly drained. It always occurred either in the spring or autumn, when there had been very growing weather, causing a flush of grass. With red-water I have had no experience, but am aware that it is accompanied by great debility, and that tonic treatment is the only remedy, and doses of balsam copaiba have proved very advantageous.* So important is a daily supply of sound food to the animal frame, and so necessary, that those who have the care of valuable stock should understand the principles of health and disease. I do not say in all cases, but in the majority of cases where grass land is unhealthy for stock, it is either because an excess of moisture impoverishes the herbage, prevents a steady growth in early spring, and causes a too rapid and luxuriant herbage in summer, or else, that our soil is deficient in alkalis, lime, and bone earth. This latter we can ascertain by an examination of the natural herbage. Whenever we find clover, lupin, &c., we may doubt the advantage of using bones; and if we farther find the soil rich in lime, we may feel satisfied that our money will be thrown away on bones or lime. We tried a series of experiments at Cirencester, on grass land, on the oolite, and could never see the least benefit from bones, superphosphate, or lime; and this experience will, I am sure, be corroborated by all who farm upon limestone formations. When, however, we have to do with pastures on the sandstone or iron-clay formations, bones and lime tell marvellously, because these materials are deficient in the soil naturally, and we have been removing what little there was in the shape of hay, milk, and meat, &c. Artificials are very costly, and a mistake in using an article that is not needed will be a great loss. I would, therefore, recommend every one to try an experiment for himself, using bones, superphosphate, and ammoniacal manures. Where bones are found to produce no effect, ammoniacal manures will tell; but as Mr Lawes has ably shown, well-made farmyard manure, which contains all the mineral food of plants in addition to ammonia, is the best dressing for grass land, especially when it is worked up into a compost with soil, lime, &c. It is a great question as to whether we can best improve a pasture, or break it up and resow; some are so hide-bound, so overrun with couch grass and other weeds, that it seems at first hopeless to try and develop good grasses and destroy the rubbish. Still I have known very remarkable improvements effected by care and attention; and, as a general rule, I should recommend improvement rather than reconstruction, which is usually a tedious process. There are soils and situations so favourable to grass, that if we leave land at rest for three or four years it becomes covered without any seeds having been sown, and in such cases it will answer best to break up, take a crop or two, and relay; but this is exceptional, and we must remember that we thus destroy to a great extent that mass of vegetable mould in which the roots of grasses delight, and which is so difficult to re-form. The surface of rough land should be well harrowed over and over again, until the couch-grass, moss, &c., are pulled out and the air let in. In a work on agriculture, published in 1807, and which abounds in good practical matter, I find a scarifier with two sets of teeth, invented by Mr M'Dougall of Oxford Street, recommended for this purpose; and when harrows are not heavy enough, I would recommend the use of any ordinary scarifier to tear out the moss and weeds. Constant rolling is also beneficial, tending to produce an even, firm surface; good grass only

* I may mention the following treatment which has been found successful:—
Boil 1 oz. of nitre in 1 pint of skim milk; beat up the yolk of an egg in from (according to age of beast) 2 to 4 tablespoonfuls of balsam of copaiva, and boil the whole together, and give it to the animal. Repeat the dose next day if not cured. Care must be taken to keep the animal quiet, and avoid aperients when the water is red.

grows on a firm surface, every one must have noticed the superior quality of the herbage wherever a footpath crosses a field. Levelling any irregularities, and sowing a few seeds to replace the couch, &c., harrowed up, knocking off nettles and salting the ground, spudding up thistles, and generally looking after the surface, and, above all, applying bulky dressings of soil, farmyard-manure, lime, &c., almost anything bulky, as food for grass—thus road scrapings from granite, or flint for clay, and from limestone materials on sandy land or land deficient in lime—will do much good. As an instance of great and remunerative improvement on what was a most unpromising tract, I give a few details of the work at the Manor Farm, Braydon. Braydon is a large tract of flat clay land, principally in grass, which probably contains some 20,000 acres. The traveller by the Great Western Railway touches one side of this extensive district when proceeding from Purton to Minety stations. It is nearly all in Wiltshire, bounded on the north by Minety, south by Brinkworth, to the east by Cricklade, and to the west by Charlton. Until a comparatively recent date Braydon was not penetrated by any roads worthy of the name; cart tracts with fearful ruts, fatal to modern springs, formed the only approach to the scattered homesteads. The lower land was deluged by water, and the whole tract exceedingly wet. Small fields and high straggling fences render Braydon famous in the hunting annals of the V. W. H. The character of the herbage is coarse and poor. Carnation grass, juncæ, and bull pates abound, and the surface exhibits that starved blue look that indicates water and poverty. In wet seasons such lands suffer severely, producing sheep-rot, and the half-starved store stock that wander about the pastures are unhealthy; indeed, some of the Braydon land is so poor and wet that it is an old saying that "it would rot a goose." The rents vary from 7s. 6d. to 15s. per acre. Such was the condition of the Manor Farm, a tract of 300 acres, purchased by Mr E. Ruck, at Lady Day 1862, for £4000, being exactly £13, 6s. 8d. per acre. In the following May I walked over the land, and, as it was a very wet time, had a good opportunity of judging of its value unimproved. It was principally in grass, the fields small, and surrounded by wide straggling fences, the ditches half-filled with soil and accumulations of vegetable matter, and the soil so saturated with moisture that it was difficult to struggle through the mud. Nothing, not even Talpa's Farm, could present a more dreary and desolate appearance, and it was certainly a bold undertaking to embark capital in reclaiming such apparently poor stuff. Mr Ruck divided the arable and pasture land into equal portions, keeping the latter near the homestead; the former, originally in sixteen fields, was laid out in four enclosures of equal size, and this, as well as a great part of the grass land, was thoroughly drained three feet deep and eight feet apart, by the mole-plough, driven by steam, which has so far answered extremely well. Mr Ruck estimates the cost at only 10s. per acre: I prefer doubling the amount, as more nearly approaching the contract price for such work. Mr Ruck, who has been a very successful steam-cultivator, had his original 12-horse engine fitted with a windlass, suitable to draw the draining-plough, and thus made a capital job. Deep ditches have been dug, into which each drain empties, four or five pipes being placed in the mouths, to keep the outlets open. The draining has made the surface firm and sound. In April 1862, 2 cwt. of superphosphate of lime and 1¼ cwt. of guano was applied with the water-drill, diluted with 600 gallons of water per acre; the cost of this dressing was 26s. Sheep were fed on the grass, eating cake and corn at 10d. per head per week, and the return was 17d. per head weekly. In April 1863, the same dressing was repeated, and sheep-feeding with corn was commenced as before. The grass grew so rapidly, and became so rank, that the sheep were removed, and after being shut up the land was mown, and 25 cwt. of hay per acre was secured. In the autumn a compost, consisting of soil from new ditches and old banks, mixed with lime, gas-lime, and a portion of manure, was applied. In the last year the same artificials were used, the whole mown a fair crop; and when I visited the farm last autumn, compost similar to that alluded to was being carted out and spread on the land. None but those who knew the Manor Farm in its original condition can appreciate the improvement that has taken place. Instead of the poor, watery grasses, we now find a rich carpet of quite good grasses and clover, and the cattle and sheep look healthy and thriving. At the time of my visit, the stock numbered 133 head of young cattle, principally yearlings; 13 horses, for breeding; and 240 sheep. The cattle had 2 lb. a-day of cake and corn, and the sheep ¾ lb. Beans, peas, barley, wheat, and palm-nut meal were mixed up, and for every 4 lb. of such meal 2 lb. of oilcake is used. On this grass, where sheep are hardly known, Mr Ruck has wintered shearlings with corn. These improvements, with proper buildings and roads, have doubled the value of the land, and proved a good investment. As a further instance of the capacity of

worn-out pastures for improvement, the experience of Mr Campbell, of Buscot, may be noticed. The Buscot estate is situated on the Oxford clay, naturally suited for grass, but from a long course of neglect it was reduced to a miserable condition. Thorough drainage was first carried out; then three experiments were tried. 1st, The turf was carefully pared off, the surface dug over, and then relaid, under an impression that aëration was required, and that this exposure would lead to the decomposition of mineral food. The cost was heavy. No additional food was obtained, and the humus was lost so congenial to grass, and that firm condition of surface without which fine grasses cannot grow. This may be at once dismissed as a failure and mistake. 2d, The turf was pared and burnt, a course of crops taken, and the land seeded down. Here many years must elapse before a good sward can be obtained. And lastly, the turf was left, and improved by manure and sheep folding; and this was the most successful and economical system, and the improvement on the Buscot herbage has been very marked. These results are interesting as showing that the most hopeless-looking grass on clay is capable of profitable improvement. We must now consider in what way we can *most economically* restore fertility to worn-out, exhausted pastures. Draining having removed the water, and the air being able to circulate, the natural food will be slowly eliminated, and in process of time the finer grasses will struggle into life. Still we must encourage their development by applying suitable food; and here it is most difficult to enter upon any reliable details, inasmuch as the wants of the field will depend on the nature of the soil. A gentleman farming on the old red sandstone, for example, advocates bones steamed, ground, and passed through a half-inch riddle, dust and all, 5 to 8 cwt. at a dressing, and repeat the dose after four or five years, reducing the dressing to 5 cwt. A gentleman, Mr. Thomas Little, whose experience has always been upon a limestone formation, says, "I once tried an experiment with fine bone-dust and superphosphate of lime on dry pasture. It was on a small scale. The lots were marked out, but I could never discover the least benefit from either manure." This agrees with my own experience at Cirencester, and I allude to it again, in order to guard any from applying bones, lime, &c., without first ascertaining that the soil is deficient in such materials. The geological position of the land is not always a safe guide, for the surface is often covered with a drift totally different. The application of nitrogenous manures alone is not often to be recommended. They undoubtedly cause a great increase in produce for the time, but the quality is not improved. Certain grasses are developed at the expense of others, and it naturally follows that if unaccompanied by mineral matters such applications must tend to exhaust. If, however, we can apply bulky materials, road scrapings, mixed with a quantity of farm-yard manure, cleanings out of ditches, waste vegetable matters, all well rotted and thoroughly mixed up, and applied in autumn or winter, 15 to 20 loads per acre of such materials will do much to encourage a mixed and improved herbage. The cleaning out of ponds, when well mellowed with lime, (about five bushels of lime to every ton of mud,) and left mixed for a year, will make a good dressing. You all know the result of the manure experiments at Rothamsted, which, as far as they go, are very instructive; also the advice given by Dr Voelcker as to the mixture of mineral manures, guano, &c., which he recommends, and which I suspect constitute the ingredients of the special grass manures which have in many cases proved so beneficial. But these applications are expensive, and it is as well if we can avoid them. Bones we must use, if the clay is deficient in lime. The cheapest way to improve grass land is to fold sheep eating oilcake or other artificial food. It of course takes time, but if slow it is very effectual. "The sheep's belly is the best dung-cart." This is the plan I most strongly recommend. The mechanical effect of the treading, especially in wet weather, is considerable. I have seen wonderful improvement made in grass land by sheep-folding. At the same time, applications of a bulky nature, as described above, may be collected and applied without a very heavy outlay. In this way a great improvement may be made in neglected grass land—an improvement which will be found highly remunerative. Grass land once put into good heart must be maintained by periodical dressings, by careful attention, rolling and chain-harrowing the surface, and by either collecting the droppings of cattle into a heap and mixing, or else carefully knocking and keeping the outfalls of the drains cleared out.

IV.—Value of Irrigation.

Water, which, as we have seen, is so injurious when in excess, may yet, under proper management, be made of great use in fertilising grass land. Irrigation has been practised from early times. The merit of the discovery is claimed by one Rowland Vaughan, who laid out water-meadows in Herefordshire, during the reigns of Eliza-

beth and James I. The inhabitants of South Cerney, a village in Gloucestershire, on the river Churn, also lay claim to the honour. A tradition was current that the practice was introduced by a wealthy farmer of South Cerney, one Welladvise. Irrigation in this country is most successful on land that possesses a porous subsoil and a natural drainage, by which the excess of water can escape. In such circumstances irrigation proves of great value, supplying moisture which fertilises, but does not make the soil cold or prevent the circulation of air. If strong lands are irrigated, we must take care to have the subsoil very thoroughly drained and the surface carefully levelled, so that the water may nowhere stagnate, and even then we shall find that the produce is not so healthy as that from a dry porous soil. A great distinction should always be made between irrigation proper and flooding; in the former case, the water regularly flows over the surface, and should be always in motion, gently trickling. In the case of natural flooding, it comes and goes in a most irregular and uncertain manner, and, although leaving valuable sediment, the water often remains on for weeks at a time, becomes stagnant, and poisons the grass. Circumstances are the best guides in this important operation. According to the Rev. Mr Wright, who described the South Cerney system, the water should be turned on in November, and kept on three weeks. During December and January, the great point is to shelter the grass from frost, &c.; at the same time it is necessary every ten days or a fortnight to take the water off entirely, in order that the land may get aired, otherwise the roots of the grass will rot. Care is also necessary to see that the water flows regularly and evenly over the surface. In February great care is required, and much depends on the judgment of the *drowner*. If the water remains on too long, a white scum forms, which is injurious to the grass; if taken off and sharp frost follows, grass is cut up. Water in February should remain on about a week; then take off altogether for as long a time, securing, if possible, one dry day after removing water. In March the early feed is ready. The sheep may be folded over until May 1, then a week's water will start the hay crop. Many instances occur in which the circumstances would allow of irrigation, but either indolence or ignorance of the benefit prevents its being carried out. The necessary conditions are a porous subsoil, land lying on a gentle slope, contiguous to and somewhat lower than the river, and means to get rid of the water. In rough uneven ground, we must often lay out a considerable sum in levelling the surface, without which our water will do more harm than good; and it is because sufficient attention is not paid to this, and the water allowed to stagnate in the low spots and miss much of the ground, that irrigation is so often worse than useless. We may say, as a general rule, that water will prove most beneficial when the land regains its soundness, and walks dry in from twelve to twenty hours. Catch-meadows are suitable for hill-sides, when the supply of water is limited. They are less costly in preparation than the last described, but seldom ensure an equal distribution of water, and used water is generally inferior. The advantage of using water will depend in a great measure upon the care and attention we bestow, and upon the nature of the water. Some streams are known to be peculiarly suitable, and produce greater effects than others. Generally the best results are produced on the land where the water first irrigates. Water may be used over and over again, but as a rule those meadows nearest the source are the most valuable. Mr Wright, on this subject, says the first or highest part of a catch-meadow will be much improved; the second may reap some benefit; but the third, which receives the exhausted thin cold water, will produce an unprofitable crop. Our farmers never choose more than a second use in the same meadow, and that seldom—calling it *small beer*. The reason for the different effects of water, and the question of temperature, mineral matters, &c., are points not yet fully understood, and the question demands a careful examination. I cannot forego another quotation from Mr Wright, whose remarks are extremely practical. "In opposition to the opinion of practical waterers, I hesitate not to affirm that the mud is of as much consequence in winter-watering, as dung is in the improvement of a poor upland field. The meadows in this county which lie next below a market town or village are invariably the best, and those which receive the water after it has been two or three times used reap proportionably less benefit from it. Our farmers know the mud to be of so much consequence in watering, that whenever they find it collected at the bottom of the river or the ditches, they hire men whole days to disturb and raise it with rakes, made for the purpose, that it may be carried down by the water and spread upon their meadows. One meadow in South Cerney I think is an incontestable proof of the consequence of muddy water. It is water by a branch of the common stream that runs for about half a mile down a public road. This water becomes very thick, and when it enters the meadow is almost as white as milk. This field of seven

acres was, before watered, let for 10s. an acre, but is already become the richest la in the parish, and has produced at one crop 18 loads of hay, each load more than : cwt."—more than three tons per acre. That land, under favourable conditions, ms be greatly increased in value by irrigation, is proved by the high rents which ai paid for such land. The system is much adopted in Wilts, Dorset, Hants, and espe cially Gloucestershire, where the Valley of the Churn exhibits some very fertile tracts On this river there are about 1000 acres of watered meadow, supposed to be improved by irrigation £2 an acre of yearly rent over their original value. The advantages consist not only in the increased supply of grass, but in the early feed, which thus becomes most useful for ewes and lambs. Care, however, is required in feeding, inasmuch as the grass is often watery and unmatured, and especially in a wet cold spring sheep are apt to scour if not supplied with some dry food. The feed from March to May is considered worth £1, 1s. an acre. Shut up early in May, after being watered for a few days, there is generally an abundant crop by the beginning of July: two tons per acre is not unusual. After which a good soaking will start an eddish worth at least 15s. an acre. The cost of maintaining the ditches, flood-gates, &c., in order, amounts to about 6s. an acre. The best water-meadows are found in the valleys of limestone formation, as the oolite and the chalk, for example, since here we have a fine loamy soil on a porous subsoil. The roots of the grasses are much benefited by the thorough soaking, and the soil contains mineral food, which the moisture conveys to the roots. Upon sandy soils water may increase the bulk of the produce, but the quality will be weak and unhealthy; indeed, it must be admitted that, except in very favourable localities, irrigation causes an increased growth of coarse grass, and neither the hay nor the feed is at all equal in nutritive value to sweet uplands. As a rule, we shall find certain grasses of a quick-growing nature taking the place of that mixed herbage which is seen in our best pastures; and the tendency of irrigation is to produce a simpler herbage. This is not in accordance with Professor Buckman, who declares, in the work already referred to, that water properly used tends to improve the quality of the grass, and convert some descriptions that are ordinarily inferior into really useful grasses. This is doubtless true in the cases he has examined; but I cannot but think his experience is somewhat exceptional, at least it does not agree with my own. I believe irrigation, when practical, is of great value in securing some early grass, which, if judiciously fed, helps the ewes and lambs over a very difficult time, and the heavy crop of hay secures fodder for the upland. The after-feed I look upon as poor, and totally unfit for sheep. The late Mr Pusey went to great expense in laying-out water meadows on his sandy soil at Pusey, and it was confidently affirmed at the time that the land was perfectly healthy for sheep; hundreds, however, were rotted, and Mr Pusey found, to his cost, that he was wrong. The quality of the produce was too poor to keep animals in health, and I am afraid that the present tenant hardly irrigates at all. Why is it that such land is always unsafe for sheep in the summer and autumn, especially in moist, warm, growing weather; but that a rank, luxuriant growth of grass, unmatured, containing an excess of nitrogen, and a deficiency of sugar, is produced, which is poisonous and unhealthy? As I said before, different water evidently varies in value for irrigation purposes. Springs out of the chalk have been found in some instances to possess remarkably fertilising properties. Thus a particular meadow, the soil of which is a good loam upon a fine gravel, watered by pure-water from springs rising out of the chalk, has been mown in a warm spring five weeks after the stock were taken out. Almost every year it is cut in six weeks, and the produce varies from one to three waggon loads per acre. In the last place, we have very briefly to consider the application of

SEWAGE TO GRASS LAND.

This subject has been so frequently discussed lately, that we are all, I am sure, heartily tired of the very word "sewage;" and therefore I will very briefly allude to it. Experience of practical men has decided that sewage is more suitable—1st, for the development of strong, coarse grasses—such as Italian rye-grass and cocksfoot—than for mixed grasses; 2d, that it is more suitable for grass than arable cultivation, and that the larger the application the greater the result; and, lastly, that the rainfall of a district has more to do with the result than is commonly allowed. It is well known that the application of sewage is always most marked during moist, cloudy weather, and that in scorching summer weather little or no good, and in some instances positive harm, arises from the application of sewage. The results at Croydon, for example, can never equal those at Edinburgh, because the climate is so much drier. Then I think it must be admitted that the best comparative results will be

obtained from the application of sewage to poor light sand, which, without this stimulant, would prove almost worthless. Mr Blackburn's operations at Aldershott will be watched with great interest, as giving a further experience on this point. The application of sewage to good feeding pastures is at any rate a very doubtful proceeding, as is evidenced by the effects upon the Rugby land. We should quite anticipate this. That beautiful carpet of mixed herbage which affords the muscle and fattening materials, so well combined that we can see our cattle daily increasing in rotundity, gives place to a rank growth of certain coarse grasses. These are cut long before they are matured, a watery produce results, and we cannot expect that animals will get fat on such food, unless we add plenty of artificial. All this does not sanction, however, the lamentable waste of the liquid portions of our manure, which we so constantly see arising from unspouted buildings, uncovered yards, and the absence of any arrangements to catch and preserve these valuable fertilisers. But my advice is, do not make your manure in that way, which necessitates the separation of solid and liquid elements. Instead of going to a heavy expense for tanks, &c., cover over your yards (as described by Mr Moscrop in his very practical paper,) and then apply a small dressing of such manure to your exhausted pastures. The expense ought not to be an impediment, for this is a permanent improvement of the first kind, and the tenant can well afford to pay an interest, and the landlord to procure the capital, for work that will improve the permanent value of his property so much. Every experiment that has been recorded as to the merits of covered and open yard manure has been strikingly in favour of the former; and an additional reason at the present time is found in the saving of litter, now that straw is so valuable for food. It is calculated that, properly applied, 20 lbs. of litter a day is amply sufficient for a beast; possibly, if cut into lengths, less will do. If the situation of the farm offers opportunities of using town sewage, the land being porous and sandy, and capable of being laid out so as to receive the fluid by gravitation, and we can, in short, irrigate the surface, then it will be found profitable to use the sewage, mowing the crops for green food for milch cows, provided we can get it for a moderate sum. Mr Lawes, at Rugby, proves that the highest increase for 1000 tons of sewage was about £5, 10s. When we calculate the cost of laying out our land, &c., we shall see that 0½d. to 0¾d. a ton is about the range of price, according to circumstances, that we could afford to pay, and shows us how ridiculous are the views of those who would have us believe that the sewage is worth 2d. a ton. Gentlemen, you have patiently listened to my long yarn; I have endeavoured to bring forward some plain considerations, and now leave the matter in your hands for discussion.

Mr J. Carter (King William Street, City) said there was one thing connected with this question which it had for years struck him might be made useful to agriculture, and especially to grass lands. In the salt works of Cheshire a certain portion of the salt-pan was always clipped off. An immense quantity of it lay idle, about 10 per cent. being salt, and a good deal of the remainder iron, and he believed that if a sample were tried it would be found very useful on grass lands.

Mr Nockolds—In what way? as a manure, or for your cattle to lick?

Mr Carter—As a manure.

Mr James Thomas (late of Lidlington) said they had just listened to a very interesting lecture, but the subject was so very wide that the discussion might be carried to almost any extent. The question before them was "The management of grass lands," and knowing how many different kinds of soils there were in Great Britain, from the Cheviot Hills to the Cotswolds, and from the rich grazing meadows of Lincolnshire and Leicestershire to the West of England, they must all feel that a debate on such a subject might be almost *ad infinitum*. One thing which, as it appeared to him, circumstances had taught them within the last few years was, that strong yellow clays could not be kept profitably under cultivation with the plough, that such cultivation could not be carried on by the tenant with the hope of paying the landlord's rent, and still less of improving his own condition. The question, then, necessarily arose, whether it would be wise or unwise to lay down land more extensively in grass; and he could only say that he believed a vast quantity of inferior arable land would pay much better if it were laid down to grass, or at all events withdrawn from tillage. They all knew the great use of the Downs in the south of England, and how well they worked with other lands, and how profitable good sheep-farms had been to occupiers. Professor Coleman had spoken of the proper mode of laying down land to grass when that had been determined upon; and on that point he (Mr J. Thomas) perfectly agreed with him. He recollected reading in Mr Caird's lectures, some years ago, an account of the manner in which the tenantry of Sir James Graham, in Cumberland,

were laying down for permanent grass, that was with coleseed in June or July. They found that the trampling of the sheep at that period of the year did much benefit to the clover by consolidating the land, just as old agriculturists had found their clovers best on the headlands which had been trampled by horses. He believed that the modern plan adopted on Sir James Graham's estate, and subsequently in various parts of England, would be found the best mode for laying down land for permanent grass. As regarded drainage, he had found in his own experience, and he had heard others say the same thing, that land which was intended exclusively for the feeding of oxen and the fattening of bullocks for the London market might be overdrained. He believed Mr Congreve would bear him out in saying that land which was required for sheep alone, and land which was required for oxen alone, required very different treatment. An old friend of his, Mr Hewitt, once told him that he had found that in the management of his grass land the best plan was to put sheep, say two to the acre, in May, with his grazing oxen, because the sheep, by picking up and eating all the finer grasses, compelled the oxen to eat the coarser kinds, and after two or three weeks of sheep at the pasture, on removing them he obtained a far more level table of better land than he could otherwise possibly have had. He followed Mr Hewitt's example for twenty or thirty years after, and in no one instance had he found his theory to be wrong. He believed that no land which was naturally unsuited to grass could ever become good grazing land. The best grazing land in Leicestershire had all become so from being originally in the state of ploughed land, as the old ridges showed, and then being left to themselves. The fact was, that there was an aptitude in such land for grass, and, notwithstanding all that had been said about the quantity of quarts of seed, &c., that might be applied with benefit, he was convinced that land which had no natural adaptation for producing grass could never be made good pasture. As regarded the diseases to which lambs and cattle were subject, owing perhaps to their eating sour or bad grass, he thought that a great deal of loss might be avoided by the use of crushed malt. He did not wish to enter into the question of the malt-tax, but thus much he might say, that in advocating the free use of malt for their animals farmers had thought more of the benefit which they would gain in the fattening of oxen and sheep, than of the means which they would thus possess of securing their health. Thousands of lambs might thus be saved every year, and surely that was a most important fact for the public relative to the price of meat. (Hear, hear.) When a young farmer, he used to lose a great many lambs every year, and neighbours of his had lost hundreds in a single season. The natural remedy for such an evil was the use of crushed malt; but this they were deprived of by the pressure of the tax. As regarded sewage, he would observe that he had gone to considerable expense in order to apply it beneficially; he had a tank at Lidlington, and Fowler's best pumping apparatus, but he used them for many years with little or no result. He believed that unless London sewage were used on light soils, as on such places as Maplin Sands, there would be very little result. As to the idea of raising it to Shooter's Hill or any other elevation of that kind, and spreading it by means of pipes through the country, he felt quite sure that the attempt to carry it out would only end in the entire loss of the capital employed.

Mr Robert Smith (Emmett's Grange, South Molton) said that, coming as he did from the West of England—the land of grass and irrigation—he might be expected to make a few remarks that evening. First, as regarded irrigation, Mr Coleman had alluded to other counties, but not to Devon. In Devon, however, they were, he believed, at the top of the ladder in that matter. The irrigation of the low lands there, from the adjacent streams, was certainly very good indeed. In his (Mr Smith's) district, the mountain-streams were collected together and spread over the hill-side with considerable advantage. These are termed "catch meadows." He had some fifty acres of these water-meadows; and the land had greatly increased in value. Irrigation, indeed, was so important that it was a subject of itself, and one which required the most mature consideration. In fact, irrigation has not received its proper share of support. For instance, the quality of water had much to do with irrigation; gravitation had a great deal to do with it; and, lastly, the principle of warmth had more to do than almost anything else. Some years ago he wrote a paper for the late Mr Pusey, on the catch-meadows of Exmoor, where he described the practice which he still followed; and, instead of entering into the subject then, he would refer those who wanted to know something about catch-meadows to what he said about them in that paper. The chief feature of the water-meadow, he thought, was not altogether the growth of succulent grasses, which might be turned into hay, and

made valuable in that way, but for early feed. For instance, when they saw a barren field on one side of a hill, and a verdant meadow on the other—when they saw lambs starving on the one hand, while others were getting fat on the other hand, as he had done in Devonshire—they had there an illustration of the value of water-meadows. As regarded warmth, indeed, they all knew that, practically, climate ruled everything. One person might speak of his barley cultivation, another of wheat cultivation, and a third of grass; but climate governed the whole; and, therefore, while in the eastern counties they could not keep grass on the land, in the western counties they could not keep it off the land. When, therefore, they saw a tendency in nature to assist grasses, it behoved them to assist nature, and to get as good grasses as they possibly could. Again, whether they studied the English counties or the Scotch counties, or their own individual cases, they would always find the produce of the soil regulated by climate. It was truly said that, when farmers went from east to west, they did not transplant. Having been brought up in a dry climate, on getting into a wet one, they were too apt to continue the old system of farming. With regard to the remark of Mr Thomas, as to the period for laying down grass-land, there again he was in a position to speak practically. He had at that moment three hundred acres of grass-land which had been seeded down without a corn crop. Instead of directing his attention to corn, he had directed it to grass, on account of the character of the climate. He entirely differed from Mr Thomas's friend, who sowed his grass-seed about June or July, a period of extreme heat, when they would not cover the ground. So far as his experience went, the best way of laying down land for permanent pasture was to prepare and clean it as well as possible for the root-crop in the previous year (if they could sow two root-crops in succession, so much the better), and in the next season, as early as the frost would allow, to put in the grass-seed. Say by the 1st of April, rapeseed should be sown with the grass-seeds. If the seeds were sown thick enough, they would soon be up, and they would prove most verdant and be ready to stock by Midsummer. The land would thus have a covering before the heat of the sun came, and be most valuable in the scarce hot months of July to September, a period when they found the greatest difficulty in getting food for their animals, the young seeds would throw up such an immense quantity of succulent, feeding-grasses, that no doubt would remain in the minds of those who saw them, as to what period was best for sowing. There was a principle involved in all this. For instance, if they sowed seeds late in the autumn, they found them very feeble; sometimes they lost the plant, and they never were what they could wish them to be. For some years past, however, the result of seeding land down without corn, in his neighbourhood, at the period which he had mentioned, had been most beautiful. He must confess his regret that Professor Coleman had not entered a little more fully into the management of grass-lands. The professor remarked that there was now a growing fashion with regard to such lands. He (Mr R. Smith) did not like fashion in such a matter, as it might lead to excess, and a time might arrive when corn would be dear and meat comparatively cheap; but he was convinced that the adoption of a better system of grass-production, especially in suitable climates, would in many cases yield, for the outlay made, a return of not less than twenty per cent. Mr Thomas made a remark about grass changing after draining. There was a principle involved in this; the aquatic grasses were killed, and nature had to replant. As regarded this, he would remark that the effect of taking away the aquatics, though better for sheep, would be less valuable for cattle. Again, showing the effect of warmth, the grasses were very fine on the southern slope of a hill, while those on the north were coarse. With respect to top-dressings, he would observe that different districts had their own customs in such matters. A Devonshire farmer would go for lime at any price, and apply it to the land in compost with earth. He (Mr Smith) felt that while arable culture had a literature of its own, the grass land subject had as yet been comparatively neglected, but most especially irrigation on the catch-meadow principle.

Mr T. Wilson (Althorne, Maldon) regretted that the question had not been more specific, as it was too wide for proper discussion in a single evening, and he hoped that the subject would be taken up again in another form. The discussion had been extended to the best way of laying land down to grass, and also to covered homesteads. He would, however, confine himself to the subject on the card—the management of pasture land. The land in his neighbourhood was very strong land, and had been supposed not to be fit for grazing. All he could say, however, was that the grass-land which he held, which had been in permanent pasture, and that which he had put into grass with some care and circumspection, harrowing, rolling, and manuring it, had

been infinitely more profitable to him than land on which he grew corn crops, and the impression on his mind was, that the less land they ploughed the less money they would lose. (Laughter). He believed there was no land, that was good enough to grow corn, that would not grow grass. At the same time, he believed there was land that was too bad to grow grass, which might be made to grow corn. He remembered some Devon farmers coming into his neighbourhood, with the view to take farms, whose objection was that there was no grass. One of them, however, remarked, "look at the grass on the roadsides, in the lanes; it is good enough there, and if it will grow in the lanes, it will grow in the fields. We have only to put the lanes into the fields, and then we shall have grass enough." The natural use of land is to graze, the artificial to plough; and if the same labour and expense are bestowed on land in the one case, as in the other, the land under grass will generally be found more remunerative, or less unprofitable, than that under the plough.

Dr Voelcker (Salisbury Square) concurred in the remarks from Mr Smith, to the effect that whereas arable land had received a vast amount of careful attention on the part of the arable-land farmers, the management of grass land had been wofully neglected. It was quite true that there was land which had a natural aptitude for producing grass, just as there was a great deal of land in England which had a natural aptitude for producing—almost without any kind of manure, but simply through deep ploughing—a very heavy produce of corn. But the question was, whether there was any grass land which would not repay careful attention and yield a large increase of the produce. He believed that if the same degree of attention which had been bestowed on arable land were given to pasture, they would see the produce very materially increased, and in some cases find the character of the herbage greatly improved. Having seen a good deal of the pasture-land of Cheshire, he knew what excellent effects were produced there by a judicious application of manures adapted to the soil. He had seen great changes effected through the application of bones, both in the quantity and quality of the herbage. At the same time, he felt bound to say that he had seen the same bone manures tried in Gloucestershire, and he had tried them himself, without producing the slightest benefit. There could be no doubt as to the fact that there was grass land to which it was a waste of money to apply any artificial manure at all. It was better to apply the manure to the arable portions of the farm than to spend money on the manuring of such grass land. In short, the character of the soil must be carefully studied and watched by those who had the land in their occupation. Still, he believed that by the judicious application of proper manures, they might very materially increase the produce of their pastures. The character of the manure which was applied to the land would materially influence the result; indeed, the experiments which had been tried by Mr Lawes and others, showed that the farmer could, to a great extent, regulate his produce, and that he could grow a much larger quantity of produce than those who had not tried or read the results of the experiments might think possible, through the application of particular kinds of manure. Thus, by the application of ammoniacal manures, farmers could almost treble their produce, though, he was sorry to add, at the expense of quality. On the other hand, by the application of phosphatic manures, they could materially change the quality of the natural grasses, for the application of bones and superphosphate would greatly increase their clover and leguminous produce. Thus, by the careful study of the effects of different manures on particular soils they might in a great degree regulate what they intended to produce. He agreed with Mr Smith that irrigation deserved to occupy a much larger share of attention; and he thought that very important practical results might be expected from it, when the study of the scientific chemist in the laboratory went hand in hand with practical experience in investigating this subject. There were now so many opposing views on the part of those who had practised irrigation, that there could be no question that it was highly desirable to consider those points on which difference of opinion existed. They knew that some waters were much better adapted for irrigation than others; they knew that variations in the natural temperature of the water very much influenced the result; they knew that on some lands perfectly clear water produced the best effects, while in other cases muddy water was the best. These and other matters required to be carefully sifted; and it was vain to hope that by merely speculating on this matter they would ever arrive at sound practical conclusions. (Hear, hear). He would be glad if farmers who had had practical experience of irrigation would give him the benefit of it, and would be happy to come down to any farm to examine the water, &c., for himself, as he intended to bring the subject of irrigation before the Royal Agricultural Society of England.

Mr T. Congreve (Peter Hall, Brinklow, Coventry) could not allow the discussion to close without saying a word in defence of what appeared to him a rather maligned class amongst them that evening. He was himself a grazier, and on the part of the graziers of England he must demur to any impression going forth from that Club that they neglected their grazing land. (Hear, hear). He maintained that they did not neglect it; that the grazing land of England—and he then spoke as an occupier of such land—was a subject of as much consideration to a grazier as ploughed land was to the farmer. Grazing land required even a greater share of attention than ploughed land; and there were great numbers of men who paid as much attention to the grazing of their cattle and sheep as others did to the cultivation of wheat and barley. He did not wish it to go forth that the graziers of England, who produced for six months of the year a supply of meat for the London market, were a thick-headed set of men who paid no attention to their business. (Hear, hear). It was an old saying that any fool could make a farmer. (Laughter). It was certainly not every fool who could make a grazier. The grazier had his stock to buy and to manage; and it was one thing to grow crops, and another to buy and feed a lot of cattle and make money of them. The graziers had to keep their eye on the grass during the whole time of feeding. If they let it grow too long they were beat, and, on the other hand, if they kept it too short they were beat; and, therefore, grazing required at least as much attention as any other agricultural occupation. (Hear, hear).

Mr J. A. Nockolds (Stour Lodge, Bishop's Stortford) did not believe it was a general opinion that the graziers of England managed their grazing land badly. (Hear, hear). He had confessed himself a culprit according to Mr Thomas's view of the subject. Many years ago he was an advocate for the breaking up of old clay pastures, some farmers having told him of the large quantity of mangold-wurzel which they had thus secured, without saying anything about the bad barley crop that followed. He entirely agreed with Professor Coleman, that the renovation of old pasture was a far easier task than the making of new. There was another point to which he would refer. Valuers who visited a parish for the purpose of making an assessment to the poor rate or the tithe rent-charge, were in the habit of putting a spade in the ground, to see what was the character of the subsoil. In a large parish in Essex, with which he was connected, the grasses were very different, and yet when the spade was used the subsoil was invariably found the same. How was this to be accounted for? Drainage there was none; and he believed, therefore, the difference in grasses was only to be accounted for by difference of management. Good management would, he thought, show itself more completely on grass than on arable land. He could only account for the difference which he had mentioned by supposing that in some cases there was an accretion of soil, through continued dressings; that the roots of grass spread horizontally instead of vertically, and that on the application of new dressings the grass luxuriated, while in other cases the poverty-stricken grasses lacked that source of nourishment. (Hear, hear.)

Mr J. Bradshaw (Knole, Guildford) wished to say that he had repeatedly seen bones used in Cheshire with good results; but that, on the other hand, when he used bones in Surrey the benefit was *nil*. The greatest improvement that he had effected in pasture had been through the feeding of sheep with swedes and cake upon old pasture until it was puddled. It was his misfortune to have read, fifteen or twenty years ago, all kinds of recipes in the Journal of the Royal Agricultural Society, and amongst others, what had been alluded to that evening, as having been adopted on the estate of Sir James Graham. Having tried that system in Surrey, and had met with total failure.

Mr R. Smith—In what month did you sow your seeds?

Mr Bradshaw—Pretty early; he thought in June.

Mr Fisher Hobbs (Boxted Lodge, Colchester) said—Having lived formerly in Leicestershire, and living now in Essex, one of the driest counties in England, he considered that the management of grass should be very different in different districts. Leicestershire contained some of the finest grass lands to be found in England, and at the time when he resided in that county, thirty-eight years ago, there seemed to be little or no management. He agreed with Mr Congreve, that the best graziers paid attention to their lands; but in the county of Leicester it was formerly the practice, in the spring of the year, when cattle were first turned into the pastures, to act as if it were considered sure that the land would carry a certain number of cattle throughout the summer. Whether there was much grass or little, or whether the amount of rainfall was large or small, those animals were turned in to be fatted, and there they remained until sold in the autumn. (Hear, hear.) In his younger

days he farmed some land, part of which was park land, containing a quantity of oak trees, while a great deal of it was badly drained. He found that by draining, high manuring, and the occasional application of farmyard manures, and more particularly by the application of unfermented manure, say eight cubic yards per acre, immediately after the mowing, he benefited the pasture more than he could by any other means. He also found by various experiments that bean straw, cut in the autumn, and applied to the grass at a period when it contained a good deal of oleaginous matter, had a marked superiority over other substances when used as a manure. He had applied liquid manures in various ways with little or no success. His old friend, the late Lord Western, used to say, when he told him about what he was doing in this matter: "Young man, go on; I like to see these experiments; but I made similar ones thirty years ago, and unless an immense quantity of rain fell immediately after, the result was failure." A great deal no doubt depended on management, but it was not to be expected that in a county like Essex, where the rainfall was generally under 18 inches a year, they would have the same amount of grass produce as was obtained in the West of England. He must say he did not think the subject had been gone into deeply enough that evening. It was, in fact, one of very great importance. When in travelling throughout England they observed the large breadth of grass land as compared with the arable land under the management of the grazier and the farmer, they must all admit that with better management the results might be far more satisfactory. (Hear, hear.) There was, he thought, great room for improvement with regard to the securing of the hay crop. Not far from London they saw three or four men mowing in one part of the farm, and three or four weeks after they saw the same operation going on in a different part of the farm. The adoption of a proper system was, he believed, not the rule but the exception.

Mr Allender (Lee Grange, Winslow) said there was one question on which he would like to hear the opinion of Professor Coleman, namely, whether it was best to mow continuously or alternately. He felt sure, as the result of his own experience, that grass ought either to be continuously mown or continuously grazed. The effect of continuous mowing is to simplify the herbage, nature adapts herself to circumstances, and the bulk of the growth comes to perfection at one time; continuous grazing encourages the growth of a variety of grasses, which produce a succession of keep. The effect of mowing land usually grazed is that a heavy crop is seldom obtained, unless allowed to become overgrown, and then the quality of the hay is inferior, and the land materially injured for some years. On the other hand, if a meadow, usually mown, be grazed, the bulk of the crop comes at one time, and if heavily stocked, the cattle waste as much as they consume. He should also have been glad to hear some opinions as to the best manures for various descriptions of grass land. On clays containing lime, where white clover was indigenous, as in the best grass lands of Buckinghamshire, he thought bones were not needed. He believed that the best time for applying manure was immediately after the hay crop, and that the best kind of manure was unfermented dung.

The Chairman, in closing the discussion, said he thought Professor Coleman had given them a very good paper. He could confirm what he said about water-meadows, having occupied about 50 acres of land of that description. He had found that moss was caused by close feeding. For example, he had a piece of pasture land which grew as nice a grass as could be desired. He turned in a flock of ewes upon it; he ran his ewes there up to Christmas, for a few seasons, and the result was that the land became a perfect bed of moss. That showed the different effects of climate, and it showed also that there could be no rigid rule for farming grass land. As regarded the management of arable land, they were in the habit of saying in Norfolk that the grass-land men did not farm their arable land at all. It had been said in effect that even the arable-land men did not farm their grass land at all, and that view seemed to him pretty nearly right. (Hear, hear.)

Professor Coleman, in replying, said—The proper answer to Mr Allender's question depended very much on the varying circumstances of the soil. Supposing land to be properly dressed—and, in his opinion, it ought to be dressed at least every other year—after the grass had been mown and properly eaten down, then the tendency to become coarse would be counteracted. The cropping down close in autumn would encourage the finer grass, which would otherwise be pushed into the shade altogether by continual mowing and manuring. Constant mowing and manuring encouraged the coarser and stronger grasses.

On the motion of Mr Marsh, seconded by Mr Nockolds, thanks were voted to Professor Coleman for his paper; and on the motion of Mr Bradshaw, seconded by Mr L. A. Coussmaker, the customary acknowledgment was made to the Chairman.

SHELTER FOR CABMEN AND CAB HORSES.

SIR,—I hope that the modest refuge for cabmen which has just been erected at Canonmills is but the beginning of a more civilised state of affairs as regards both cabmen and cab horses. Why should there not be covered stands for our cabs? The wear and tear both to men and horses from exposure in such a climate as ours must be excessive. I should like to hear what the death-rate is among cab horses; for, with that information before me, it would not be difficult to calculate the amount of saving to the cab proprietors by having shelter provided for their horses when not in motion. We all know that it is possible to make a corrugated iron shed ornamental, and there is no reason why any objection on the score of appearances should be taken to such erections even in Princes Street. Supported on neat iron pillars, coloured blue and red, a corrugated iron roof would be no eyesore. At one end a coffee shop might be constructed for the use of the cabmen. If erected at the expense of the municipality, the cab proprietors ought to be called on to pay an annual rent. What that rent would be must depend on the expense of the shed. At a cost of £200, a shelter for ten cabs would entail an annual rent of £1 per cab.—I am, &c.,

A MOUNTED OFFICER.

—*Scotsman, 20th April.*

[We gladly endorse the views and second the movement of "A Mounted Officer." The subject is one of the greatest importance, and one to which our attention has been directed. Not only Edinburgh, but London, and every large town in the kingdom, should take up the matter.—ED. *Vet. Review.*]

MULE BREEDING.

IT is rare, though not impossible, for a mule mare to bear progeny. Some years ago, great attention was attracted by a case of this description which occurred near Naples. Mr A. Fonblanque, of the British Consulate at Alexandria, has communicated to Mr Darwin a notice of a "curious birth" which has taken place at Cairo, that of a foal produced by a mule. Mr Fonblanque says, so great was the excitement at this unheard-of event among the native population, that it produced an official inquiry, a copy of which, together with a certificated translation, Mr Fonblanque has forwarded, along with his letter announcing the *prodigium*. The latter consists of the deposition of one Mohamed Effendi Ashmani, a veterinary surgeon, before the police at Cairo on the 27th June 1864; and states that, on the previous day, the said Mohamed had proceeded, "in pursuance of instructions received, to the house of one Ibrahim, a master marbler, situated at Darb el Ahmar, to examine a mule which had given an offspring. It appears that the said mule had been covered by an ass, as the offspring is a jennet. The mule is twenty-two years of age; and as she has no milk, which is indispensable to maintain the jennet, directions were given for feeding it."

Although Mr Fonblanque has no personal knowledge of this case, he does not believe that "any intentional deception has been practised." "No attempt has been made to turn the affair to profit by exhibition or otherwise; in fact, it furnishes considerable annoyance to the owner of the animal."

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THE VETERINARY REVIEW

AND

Stockowners' Journal.

ORIGINAL COMMUNICATIONS AND CASES.

Food in its Relation to the Organism, with a Review of Liebig's Theory, and its Influence on the Progress of Agriculture. By Professor A. J. MURRAY, Royal Agricultural College, Cirencester.

MAN naturally reasons about the phenomena which surround him. If men had not laboured to ascertain the laws which regulate natural phenomena, and combine these laws so as to form theories, the human race would have remained in a state of savage and brutish ignorance. The sensation of hunger, and the prospect of starvation, produced that activity of the faculties which was necessary in order to form the rudiments of the arts and sciences in a primitive state of society. As man becomes civilised, and the boundaries of science become enlarged, the results of scientific investigation are used to promote the general prosperity. In the most highly civilised states the chief temporal object of the great mass of the people is to obtain a sufficiency of food; a deficient supply will produce a revolution,—deficiency in quality will produce plagues and pestilences. Few things, then, can be of more importance than an inquiry into the nutritive value of food.

Liebig appears to have been the first author who attempted to classify the elements of food, and to assign to each a special function and nutritive value. Sir Humphrey Davy's Lectures on Agricultural Chemistry were published in 1813, and on referring to those portions of the work in which the proximate elements of food are described—such as albumen, gluten, starch, sugar, and gum—he merely speaks of them as being nutritive; he does not attempt to classify them, nor does he compare the nutritive value of one element with that of another. He makes no mention of the nutritive properties of fatty and inorganic matter. This fact shows us that though Liebig's classification is far from being correct, it was yet a great advance

towards the truth, and that by directing attention to this subject he has paved the way for a correct theory of food, the principles of which are based on facts. It is no slight proof of Liebig's great genius, that on this subject he should have approached so near to the truth, while others have only been able to reach the goal by slow and laborious investigation. It illustrates the advantage which is obtained when the conclusions of the deductive reasoner are subjected to the test of experiment.

Liebig's theory of food has the merit of being easily understood; and as it was also explained and illustrated with great ingenuity by its author, it was readily adopted by chemists and physiologists. Simplicity is a great recommendation, but it must be sacrificed to truth; and it will afterwards be shown that Liebig's division of food into plastic and heat-producing, is based on a complete misconception of the structure and properties of those tissues which form the bodies of animals. Liebig's error may be traced to his regarding the body, and the food which sustains the body, from an exclusively chemical point of view; he has not sufficiently appreciated the distinction which exists between processes modified by vitality and the manipulations which are practised by the chemist in his laboratory. While we readily accept the opinion of the chemist as to the changes he observes in substances that are capable of being examined, we cannot accept his opinions as to the functions and properties of tissues when these are merely deduced from an examination of their chemical composition.

Correct views on the subject of food must be based on its relation to the organism, and it will be seen that this aspect of the subject is overlooked or disregarded by Liebig. We hear it constantly asserted by the followers of Liebig that the higher the percentage of nitrogen the more nutritive the food must be. They, however, appear to forget that the body can only assimilate a certain proportion of food, and that anything above that proportion is consequently of no value whatever so far as the body is concerned. It will also be shown that so far from an excess of certain elements being an advantage, it tends to induce disease.

Food includes all those substances which, when taken into the stomach, are capable of being modified in such a way as to supply materials for the nourishment of the body. Many different kinds of food are obtained from the animal, vegetable, and mineral kingdoms; vegetable and animal substances form the principal articles of diet; but inorganic materials, though not used in such large quantity, are not less essential to the well-being of the body.

Plants obtain from the soil and atmosphere the elements necessary to their maintenance, and in the tissue of the plant these elements undergo such a change as to fit them to support animal life. All plants, however, do not contain equal proportions of available elements, nor are those materials present in all plants in such a form as to admit of their being readily separated and digested. Some plants

then contain so small a quantity of nutritive elements as to render them of little value for food; while others contain such a large proportion of nutritive substances as to render them valuable.

Flesh and blood constitute an aliment for a great many species. The value of other animal substances depends to a great extent on their solubility in the digestive juices. Mineral matters are also indispensable to the nourishment of animals. Though mineral substances are usually eaten in combination with organic, and seldom separately, their presence in food is not the less essential to the maintenance of health. Water, phosphate of lime, and common salt, form a considerable part of the food consumed by animals.

According to Liebig, food consists, 1st, of nitrogenous elements, and 2d, of non-nitrogenous elements. Among the nitrogenous elements are comprehended—1st, vegetable albumen, fibrin, casein; 2d, animal flesh and blood. Those are termed the plastic or tissue-making elements, as they supply the materials which form the blood, and the blood supplies the materials which form the tissues. According to this theory, the nutritive value of food depends on the amount of nitrogen it contains. But as other substances than nitrogenous ones are contained in the food, some function must be assigned to them. Second class. Fat, sugar, starch, gum, and other similar substances, are said to be employed in maintaining animal heat, and are called by Liebig respiratory food. They undergo what is termed combustion or burning, *i.e.*, oxygen unites with the carbon contained in those substances, and when this occurs heat is evolved.

Besides the two classes of nitrogenous, or tissue-forming, and non-nitrogenous, or heat-producing, there is also a class of inorganic substances, such as water, phosphate of lime, potash, iron, &c. According to Liebig, the conversion of the nitrogenous elements into tissue, and the production by the respiratory principles, is only possible when the mineral matters are present. According to this view, then, they are neither respiratory nor nutritive elements. Nitrogenous elements, albumen, fibrin, gluten, and casein, are what are called proximate principles of food. These substances may be analysed into carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulphur; but these elements are not consumed by animals separately, but only when they unite to form proximate principles. Casein, gluten, and albumen exist largely in the cereals, and in leguminosæ; they are also found in various proportions in the stalks, roots, and leaves of most plants: they furnish herbivorous animals with the materials essential to the composition of the blood and solid parts of the body. When Liebig, however, says, "that only nitrogenous substances are capable of conversion into blood," their function is incorrectly stated, and is contradicted by facts. Though Liebig's hypothesis is contradicted by the phenomena which it professes to explain, it has been adopted by most chemical and physiological writers. The following observations

of Colin's illustrate this remark:* "As the quantitative determination of nitrogen in food supplies us with the proportions of fibrin, albumen, and casein which it contains, and accordingly this ought to be a tolerably exact method of ascertaining its nutritive value; the other elements, such as starch, gum, and sugar, are generally in excess, and, as a learned chemist observes, their exact proportion is not of such great importance. The proximate principles which have been mentioned also exist in the flesh and juices of animals. Animal albumen is found in the white of eggs, in the juice of flesh, and in the serum of the blood. Animal fibrin exists in the blood and muscles; while animal casein is the principal constituent of milk."

If the nitrogenous substances are the only plastic elements, it would naturally follow that they should be stored up in the body in a much larger proportion than the non-plastic elements. So far is this from being the case, however, that, according to Lawes's experiments† on the increase of fattening animals, of 100 nitrogenous substances consumed, 13·5 parts; of 100 non-nitrogenous substances consumed, 18·5 parts; and of 100 mineral consumed, 7·3 parts are retained in the increase. When we see that non-nitrogenous elements not only go to supply the waste of the body, but that actually a much larger proportion of them are used in the formation of tissue than of the nitrogenous elements, the fallacy of considering the latter as the plastic elements is most apparent.

According to Liebig's estimate of the nitrogenised constituents saved for the production of heat, the whole amount of these substances consumed by the horse in his hay and oats, by the pig in its potatoes, would only suffice to support their respiratory process, and, consequently, their animal heat; in the horse for four and a half hours, in the pig for four hours daily.

It is an error to suppose that the heat of the body is maintained by changes in the food; the food repairs the waste of the body, and animal heat is maintained by the oxidation of the tissues. If food were necessary to maintain heat, how does a hibernating bear live? It has eaten no food during its long period of slumber, but at the commencement of that period it was sleek and fat, at its termination it looks as if it had been practising the Banting system—even its shadow has grown less. It has lived like a fraudulent banker whose dividends are paid from his capital; it does not collapse, however, and is favoured by nature as its prototype is by fortune, and it soon grows fat and respectable by gorging itself on the flesh and blood of its weaker fellow-creatures. During that period, then, when the bear *did not eat food*, the temperature of its body must have been maintained by the oxidation of its tissues. The fat of the bear's body has diminished more rapidly during the period of hibernation than any other tissue; it must therefore be more readily oxidised than the other

* Traité de Physiologie Comparée par G. Colin. Paris, 1854.
† Mr Lawes "On the Chemistry of Feeding Animals." Dublin, 1864.

tissues. Food containing a high per centage of the nitrogenous compounds must be given in moderate quantity. Though that which is not assimilated increases the manurial value of an animal's excrements, yet it is found that an excessive quantity of such food disturbs the balance of health, and renders an animal liable to intestinal disorders, and to other maladies which depend on the proportion between the solid and fluid constituents of blood being altered from the healthy standard, by the system of feeding and treatment. The chemical composition food may be unexceptionable, while its physical characters may be such as to produce disorders of the digestive organs. Food may be hard and insoluble, and by its mere presence in the intestinal may be calculated to produce irritation and disorder. Bean-straw is certain to produce such disorder in horses. It seems very improbable that the chemical composition of food will ever form a criterion for regulating the quantities given to animals. If it cannot accomplish this, however, chemistry assists us in understanding those wonderful processes, by which the destructive and constructive powers are equally balanced, which never rest for a moment, and cease only with life.

(*To be continued.*)

Veterinary Records.—Roaring as a Result of Obstruction in the Nasal Passages. By G. ARMATAGE, M.R.C.V.S.; V.S. to Right Hon. the Earl Vane.

AMONG the various causes which occasionally give rise to that condition in horses termed "roaring," tumours within the nostrils are included.

Their presence for a time are not regarded; but contemporaneous with their growth and development special symptoms appear, which, in a majority of instances, eventually assume a distressing and urgent character.

Nasal tumours have been classed as "fibrous and soft polypi, and osseous."

The former may be single or multiple, having an attachment by means of a pedicle to the turbinated bones, occupying more or less the inferior portions of the passage, and in some instances protruding from it; or resident within one or other of the sinuses, deriving their attachment from the lining membrane.

The osseous tumour does not so commonly come beneath our notice as the preceding, but may be described as mostly occupying the position of the turbinated bones, where they attain considerable size, giving rise to no slight inconvenience.

One of the indications of tumours being located within the nostrils, is the interruption to the free passage of air in respiration. This may

be partial or complete, which state will be observed by the sounds emitted during rapid exertion, and the greater quantity of air drawn and expelled through the free side. As their growth in the ordinary run of cases is slow, extending over a great length of time, other symptoms of their presence will be developed, *e. g.*, discharge of mucous, pus, or blood from the affected side, with swelling of the facial bones, softening, and even caries in neglected and maltreated cases. Percussion over the abnormal region affords a marked contrast with the healthy side, a dull sound being emitted. Under continued work the animal loses condition, particularly in cases of an aggravated nature, either from the extensive irritation and ulceration consequent on the movement, in respiration, of the diseased growth, or direct interference with mastication, as a result of acute pain, and softening, or caries of the surrounding bones.

It occurs to my memory at this moment that a gray cart-horse which came under my notice some years ago, exhibited the peculiar features of the condition now under consideration, in a characteristic manner. He was purchased at a fair from a gang of Leeds horse-dealers, well known to be most perfect swindlers of their craft; and being a remarkably good-looking animal, my friend, feeling sufficient confidence in his opinion of what constituted a horse, unhesitatingly purchased.

Soon after being put to work the difficulty in breathing was noticed, and accompanying the frequent attempts to gain relief by forcible expiration, large quantities of fœtid mucous and pus were ejected. One of the gang who had been placed to watch their animal now volunteered his "certain opinion that he was a roarer, and no gammon," supplementing his assertion by the fact, "I knowed him to be no good, nor the men ye got him from; and if he wor for sale I doant mind stannin' a fiver." He was continued at work until the owner became disgusted with the appearance of the animal, when he was sold, at an enormous sacrifice, of course, and also, as a result of the usual watchfulness, came again into the possession of his previous swindling proprietors, who afterwards had several successful bargains with other unsuspecting purchasers. No treatment was resorted to to remove the polypi in this case.

A chestnut mare, about fifteen hands high, the subject of an osseous tumour, was noticed by me about eight years ago. Upon examination, I found the animal was only five years old, of good proportions and capabilities, and, but for this affection, well calculated to fulfil the duties desired of her by the owner, a country butcher.

A limited quantity only of air passed up the left nostril, and that produced a sharp hissing sound, which was considerably increased during exercise, but had not already given rise to signs of distress. A considerable time elapsed before I had an opportunity of again seeing the mare, when the facial bones were considerably swollen on the affected side, hot and tender; a discharge of a fœtid character escaped from the nostril, which at times was mixed with blood. Any attempt

at minute examination was greatly disliked by the mare, and she exhibited such indications as led me to suppose that she had been the victim of constant brutality, which, if not considered in the light of a primary cause of the affection, most certainly was well calculated to aggravate it.

The infirmities dependent upon this state of things were daily increasing, but the owner declined to call in professional assistance. I next saw her in other hands, a cow-leech, who had taken charge of the case, "no cure no pay," and, in the end, took her at a low figure "to cure her." The treatment consisted in "eating out the cancer," by an ointment of rare qualities, compounded according to some well known recipe, the active ingredients of which were acid. arsenious. cum hyd. bichlor.

Having removed the external bones, &c. by the aid of pliers and ointment, a large irregular osseous tumour was observed to block up the passage. Breathing was established through the superior portion of the wound thus produced, the molars were interfered with, portion of the fleshy cheek wanting, mastication greatly interfered with; and after being ridden some time in the old gentleman's practice, with a piece of canvas over the parts, the suffering creature disappeared suddenly, no one knew whither.

Two cases of tumours within the nostrils, differing materially from the ordinary polypi, and producing material effects, have been brought under my notice, a description of which is as follows: A black pony, three years old, about twelve hands high, was purchased at Doncaster April fair. Shortly after he had been broken to harness, the groom declared him to be a roarer, the real cause of which was not suspected, and the affair was looked upon as a bad bargain.

For more than twelve months things remained almost stationary, when, however, a rapid increase of the difficulty in respiration took place during work. Upon examination, I found the right nostril was the principal passage for air, a small portion only passing through the left, and only in expiration, causing the false nostril to dilate, and when inspiration was commenced it would suddenly flap and collapse, giving rise to symptoms of suffocation when the right nostril was firmly pressed close by the hand.

An enlargement was observable on the outside, beneath the skin, situate rather above, and in front of the nasal opening, about two inches in length, oval in outline, and about one in width, the long axis being placed from above downwards.

When the finger was passed up the passage, it was found to be closed in greater part by the larger half of the tumour which projected internally upon the septum nasi, giving rise to great irritation and excoriation, discharge of mucous and pus, which accumulated above during seasons of quiet. In this position the tumour received two coverings, an outer by the skin, and an inner by its modified reflection within the passage.

On pressure slight pain was produced, and it resembled a tightly distended India-rubber bag.

Manipulation failed to move it beneath the coverings from its position. I looked upon it as an encysted tumour, and determined upon its removal by the knife, which was readily accomplished by a longitudinal incision being carried through its entire length, and careful dissection down the lateral surfaces. It was found to have attachments to the inner and outer coverings, particularly the inner, which was inseparably woven with its natural walls, and of course obliged to be removed with them. The hemorrhage was insignificant, and called for no attention.

The wound being closed by the ordinary twisted suture, I allowed the animal to rise; and afterwards it did well, and remained perfectly free from the causes which produced the roaring.

The tumour possessed a strong fibrous covering or sac, and resembled in shape an elongated ellipsis. It was tense, and required moderate pressure between the fingers to cause its parieties to yield. An incision carried through its length showed it to be made up of a condensed material of a fibrous character, in the centre of which was a cavity full of a gray-looking matter, which oozed through a small orifice in a ropy manner, which, from its tenacity, coiled upon itself, forming a mass not unlike a bundle of cord, twisted and ravelled in every conceivable form.

A few months subsequent to the above case, I met with another, the subject being a thick-set brown cart-mare, and suffering in a similar manner.

I endeavoured to obtain permission to remove the tumour, which had existed and continued to increase slowly for more than two years, now rendering the animal of little use to the owners, but was informed that a member of the profession had declared the offending substance was of such a nature that to remove it would cost the animal's life. I learned afterwards that by his advice she was destroyed. I thus lost an opportunity of investigating the exact nature of the case, but have no doubt that it resembled the preceding in every respect.

Disease in the Head, Neck, &c., of a Cow, (Elephantiasis?) By JAMES LAW, Lecturer on Anatomy in the New Veterinary College.

THE peculiar and highly interesting case which forms the subject of the following remarks was, in March last, kindly sent to the New Veterinary College for dissection by Mr James Ker, veterinary surgeon, Peebles, at the request of Mr Thomas Todd, M.R.C.V.S., then one of our students. It is to be regretted that a fuller history of the case cannot be had; but even as it stands, it can scarcely fail to prove interesting to the readers of the *Review*.

The subject, a small cow of the Ayrshire breed, and at the time of her death seven years old, was purchased by her late owner, a farm-servant, a short time prior to Whitsunday 1863, with the understanding that she should be delivered at the *term*. At the date of purchase nothing was noticed amiss with her; but when the purchaser went to bring her home, a slight swelling was observable near the root of the left ear. This went on increasing; and when Mr Ker was called, in the beginning of July 1863, there was a great swelling "at the back of the ear, and all over the parotid gland, with a pock hanging in the intermaxillary space, and a little enlargement down the cheek." The treatment at first adopted consisted in fomentations for a couple of days, and afterwards the application of an embrocation of soap liniment and ammonia. This treatment led to so much fever, that it had to be suspended, in order to save the poor animal's life. Six or seven months later the same treatment was adopted, with a similar result.

The enlargement appears to have gone on increasing with little or no interruption, but for long it confined itself to the parts posteriorly to the eye. It was only in the spring of 1864 that it encroached on the anterior part of the face. At this time she was unable to masticate; and Mr Ker found, on examination, that "two hard bodies, about the size of marbles, existed at the opening of the parotid duct. These in time came to suppuration, and the swelling began then to come over the face and lips."

She took the bull in 1863, and in the following spring had a calf; but it was small, and badly matured.

At the beginning of the summer of 1864 she had an attack of rheumatism in her body and legs, which greatly reduced her. She was then excessively lame, being only able to walk a few yards without lying down; but by the autumn she had completely recovered from this. It is noteworthy that, at the same time, the swelling of the face had greatly diminished, the disease being at this time scarcely recognisable, save by the entire absence of hair on the affected side of the head.

Throughout its whole course the disease was much affected by the state of the weather. Cold, damp, and changeable weather invariably led to an increase of the swelling, while a dry mild season had a directly opposite result.

The patient does not seem to have shown any desire for the bull during the course of last summer, and had accordingly no calf this year; a circumstance which may, however, be perhaps justly attributed to the rheumatic affection.

Besides the treatment by stimulating embrocations above referred to, various other plans were adopted. Setons passed through the tumour operated quite as badly as the blisters. Preparations of iodine, externally and internally, seemed to have a temporarily beneficial effect, but exerted no permanent curative influence. Sedatives and stimulants had to be resorted to at different times to counteract

the general constitutional state. "What bears on my mind now," remarks Mr Ker, "is that free scarifications over the swelling would have had a good effect. There is one place on her cheek that was freely scarified; it was long in healing, but after it healed it was firmly adherent to the bone, and no swelling took place."

On her arrival at the college the cow was in low condition, but fed well, and did not appear to be more impoverished than many such cows are at the same season of the year. Her functions generally did not seem impaired; and she was lively and spirited. Her head, however, presented a most uncouth and repulsive aspect. The entire left side of the head was denuded of hair, the depilation extending as far back as the ala of the atlas; the surface consisted of a number of irregularly-formed eminences, separated from each other by fissures of variable depth and extent, and covered by a thickened cuticle of a horny consistency, which separated in scales of considerable size. One fissure, extending from the outer canthus of the eye to near the angle of the lower jaw, was nearly eight inches in length. This was in the seat of the scarifications above referred to; and here the skin was felt to be most intimately connected with the subjacent long structures.

The entire denuded surface had a dirty-white appearance. Beyond the margins of depilation the skin was resolved into great tuberous indurated masses, with the hair only slightly diminished over their surface. These portions, which extended for a considerable distance downward on the lower border of the neck, terminated by an abrupt margin, becoming continuous with the true skin; and at such points the hand could be passed inward beneath the morbid mass, showing that it was quite distinct from the subcutaneous tissues.

The following measurements, taken immediately after death, will serve to illustrate the extent of the disease:—

	Diseased Side. Feet.	Diseased Side. Inches.	Healthy Side. Feet.	Healthy Side. Inches.
Distance from the root of the horn over the angle of the lower jaw to the median line of the intermaxillary space,	1	6½	1	1½
Distance from the nasal angle of the eye to the median line of the intermaxillary space,	1	5	1	0½
Distance from the middle of the nasal bones to the angle of the mouth,	0	9	0	7
Distance from the root of the ear to the median line of the muzzle,	1	11½	1	7½

	Feet.	Inches.
Circumference round the eyes and angles of the jaws,	3	3½
Circumference at the angles of the mouth,	1	9
Distance from the median line of the muzzle to the margin of the diseased mass in the neck,	2	11
Distance from the angle of the left jaw to the posterior extremity of the tumour in the neck,	1	1½
Breadth of the diseased mass in the neck,	1	2
Ditto ditto in front of the ear,	1	5½
Ditto ditto in front of the eye,	1	2
Ditto ditto at the angle of the mouth,	0	9½

The average thickness of the diseased skin, when removed, was over

1¾ inches, the greatest thickness about 2¼ inches. The microscopical characters of the dermis seemed to differ little from those of the natural skin. There were the usual fibro-areolar fasiculi interlacing and leaving interspaces of considerable size, which were filled up by vessels, nerves, and cells, a few of the latter containing fat. The areolæ seemed larger than natural, and appeared to the naked eye as yellow spots on the cut surface.

The deep layer of the dermis, on the whole left side of the face, was intimately connected with the muscular tissue, so as to appear quite continuous with it; and the muscle itself had in great part given place to white fibrous tissue. This metamorphosis was not confined to the motors of the nose and lips; but the masseter and temporalis, as well, had in their greater part undergone this degradation.

The skin and mucous membrane at the anterior nares were much thickened, those on the left side nearly closing the orifice. This hypertrophy of the mucous membrane was continued nearly as far back as the posterior nares. The papillæ were unusually prominent, but the intimate structure of the membrane did not appear much changed. The turbinated bones on the left side appeared to be, to a great extent, decalcified, so that on drying they collapsed, almost entirely obliterating their internal cavities.

The lips were greatly thickened, particularly on the left half of the mouth, and the buccal membrane had for a considerable distance undergone a similar change. This was particularly marked on the hard palate, though the vascular plexas beneath appeared normal. The bones of the hard palate were nearly a line thicker than those of a healthy skull.

The rows of molar teeth on the left side were abnormally curved in an outward direction. The deviation was greatest in the second, third, and fourth, the third—the farthest—being nearly three lines farther outward than the corresponding tooth on the right side. The bone on the outer side of the alveoli, for the molar teeth on the upper jaw were unusually prominent, and the tubercles representing the maxillary spine were almost obliterated. The alteration in the bones was, however, to be observed on the whole left side of the face. Thus the whole outer surface of the left ramus of the lower jaw was more prominent, asperous, and softened, than that of the right, the change being greatest in the vicinity of the condyle. The bones below the eye—the lachrymal, and portions of the frontal, malar, and superior maxillary, had, however, undergone the greatest modification. These were soft, covered by slight rugosities, spongy; apparently wanting in calcareous materials, and having some resemblance to cancellated tissue. The sutures uniting these bones were opener than is natural, and there was a distinct falling in of the bones as they approached them. A vertical section of bone taken from this part and placed under the microscope, shows large openings, evidently representing the canals of Havers, but more analogous to the cancelli in the denser parts of the spongy tissue. Around these enlarged canals

the osseous tissue is deposited in a somewhat irregular manner, and not in regular concentric plates with intervening lacunæ and canaliculi. On adding a drop of hydrochloric acid to decalcify the specimen, a regular fibrous framework was left.

The articular surface of the left condyle of the lower jaw had a peculiar fossa, about a quarter of an inch in depth, on the posterior part of its inner half. It did not appear to have undergone any morbid change recently. It is curious to note, that in the axoido-atloid joint, ulceration was met with on the articular surface below the odontoid process, and on the corresponding part of the atlas. It is evident that this part would most readily suffer from the greatly-increased weight of the head; but I have since found the same condition in a minor degree, in the case of a cow that died from parturition fever.

Among the internal organs nothing was observed amiss, the *autopsy* in this respect agreeing with the state of the functions during life.

One great difficulty in connexion with the present case, is that of giving it a name. It presents some characters in common with the *elephantiasis græcorum* of the human subject, but others seem quite incompatible with the idea of this affection. Among the points of agreement may be mentioned, the exudation into the substance of the skin and its hypertrophy, without marked change in structure; the implication of the subjacent soft textures where the greatest changes have taken place in the integument; the fever and other constitutional symptoms; the aggravation under the influence of cold and damp; its intractability by blisters, setons, and local stimulating applications generally; and its steady progress without any permanent improvement, until the cow was considered useless.

It differs, however, in some very important features. Thus there appeared to be no morbid alteration in the bronchial and mesenteric glands and other internal organs. It may be said that the reproductive functions were placed in abeyance, but it is questionable whether this did not depend on the debility consequent on the rheumatism of the previous summer, since the ovaries seemed to have undergone no essential modification of structure, and each contained a large number of Graafian vesicles, though none of these had approached the mature condition. Again, true *elephantiasis tuberculosa* is said never to affect the bones, whereas in this case these were deeply involved. It is true, that the principal alteration in the osseous tissue was met with at those points where the skin had been incised, and where it was most intimately connected with the bone; but, on the other hand, the deeper-seated bones, such as the turbinated, and even the palatine, were similarly affected though in a lesser degree.

It might be asked if this is not the same disease or an analogous one, only exhibiting some modifications in its progress, due to the particular species of animals affected, in the same way as small-pox in the human subject, and in the sheep, though distinct diseases, pre-

sent many analogous and almost identical symptoms, and may be considered the same in kind. It is best, perhaps, to avoid all discussion of this question at present, leaving the facts on record, and wait for reports of similar cases to throw more light on the subject.

Since making the *post-mortem* examination of the above-mentioned case, another one has been under my observation, presenting symptoms almost identical in kind. This, too, was an Ayrshire, and the property of an East Lothian hind. The disease had been present for about twelve months, commencing by a tumour about the size of a hen's egg, on the right cheek, and gradually increasing, until it covered the whole side of the face, and extended for some distance on the neck. In its superficial appearance, and in its confinement to the skin, and separation from the deeper tissues in the neck, where the integument is only loosely connected with the latter in health, it strongly resembled the other case. At one time it had fluctuated opposite the middle of the ramus of the lower jaw, and it had accordingly been opened at this point. On the seat of the incision, at the time of my examination, there was a large and unsightly sore, with an irregularly tuberculated and indurated mass projecting from it, and from this an unhealthy discharge had been kept up for several months. This cow appeared in general good health, fed well, and was said to be an excellent milker. She was afterwards sold at the Haddington live stock sales, and I have been unable to learn what became of her.

Reflections on Important Epochs in the History of Veterinary Science. By JOSEPH GAMGEE, Sen.

IN submitting a few fragmentary remarks on epochs, nations, and men, remarkable for the impetus given to the progress of veterinary science, it is less my aim to write a history of veterinary medicine, than to show the student that it has one. "Historical studies are, in all sciences, the most secure guides in the maze of human opinion." To the absence of such study, or any impartially elaborated work on the subject, is, I believe, in no small measure due the slow progress that veterinary science has made, and the confused and unsatisfactory state in which it now is in this country.

Instead of progressive advance, such as is possible for rational men to promote, the state of the veterinary art has been in a perpetual state of oscillation; the experience of one generation has been regarded as foolishness by its successor.

In attempting to give a cursory sketch, I purpose dividing my subject into five epochs, somewhat arbitrarily taken I allow, as these vary accordingly as different inquirers pursue their course from different points to show special aspects.

Xenophon is regarded, by writers of all countries, to be the great authority amongst the ancients, on the horse; the way to

choose him, and their management under all conditions, especially in relation to military service. This learned philosopher of Greece exhibits more extended knowledge of horses, gained by actual observation, than probably has been shown by any other writer. His concise description of the formation of the horse, of action, and exposition of physiological laws, all concur in affording proof of great mastery over his subject.

Xenophon makes such generous reference to prior contributors, as well as contemporary men, that he is the true authority and representative of the Grecian epoch on all questions relating to the horse; and his writings will commend themselves to all inquirers after truth, and for their refined eloquence, to all future generations, as they have done to the past.

With these few remarks, I pass from the notice of the greatest amongst the early philosophers; and neither shall I make any attempt to trace the steps of learning in the same sphere, from the days of Xenophon, to an advanced period of the Christian era.

It may be said that the knowledge of the Greek writers on veterinary science, as on other philosophic pursuits, was not lost to posterity; it is true none the less, that some procedures, which probably were not in vogue in their time, no mention having been made of them, had their origin in later times. I allude, especially, to the art of applying iron shoes; the most important, in its effects, on the usefulness of the horse, as civilisation advanced, and extended west and northwards, of any branch of knowledge applicable to the management and treatment of horses.

From my own limited acquaintance of the early Italian authors, as well as from all that can be made out from Ercolani's excellent work,* the most elaborate on the history of veterinary science extant, it appears that the wisdom embodied in Xenophon's writings was made the foundation on which the southern Italians enlarged their experience; and as near to our own time as the seventeenth century, M. Garzoni, then a Venetian senator, in his work "On the Art of Well Understanding and Distinguishing the Quality of Horses; the Cultivation of a Noble Breed, &c.," uses language and precepts almost identical in many places to those of Xenophon, near two thousand years before.

The Neapolitans appear, from their works, published at Venice during the early periods after the art of printing came into vogue, to have occupied the first ranks in the art of horse management, including the art of farriery and veterinary science.

To the critical inquirer alone would reference to the many works published in Italy during the earlier centuries of the Christian era, be of great interest. Ercolani has been most indefatigable in searching over the collections of manuscript on the subject, contained in

* Ricerchi Storico, Analitiche, sugli, Screttori di Veterinario. G. D. Ercolani. In two volumes, 1851-4. Turin.

the public libraries of Florence, from which numerous interesting extracts are given by him.

I shall now proceed to epoch the second. Carlo Ruini fills a similar heroic place in the Italian history of veterinary science, to that so pre-eminently occupied by Xenophon in the annals of Greece; with the difference, that important and marked progress is inaugurated by the latter, the father of the anatomy of the horse.

Carlo Ruini, a native of the ancient university city of Bologna, of which he became a senator; cultivated the study of anatomy at the then renowned medical school of Padua, a few years before our countryman, Harvey, went thither, and succeeded in giving the last touch to the all but exhausted subject, that of the circulation of the blood. I shall not dilate on Ruini's claims, as the one among anatomists whose views on the subject preceded Harvey's, and who had independently made such advances as to have left the way clear, and the discovery a stage nearer than he found it. It is, however, as the founder of veterinary science, that we, as veterinarians, may refer to the memory of Ruini.

I cannot take notice in this place of the many writers which appeared soon after the appearance in 1590 of Ruini's folio work on the anatomy of the horse, illustrated with numerous splendid plates. Italy, France, England, Germany, and Spain, had subsequently each their followers in the steps of the great master just noticed.

Two authorities, following closely on the Ruini epoch, deserve special notice, because I believe that science was advanced, and experience, founded on observation, was established by them, which formed the bond of connexion between the Italian age of veterinary science, and that which, a century later, was advanced from this higher standard and broader basis, in France, by Bourgelat.

G. A. Borelli, of Naples, a great philosopher and mathematician, left his famous work in three volumes, published after his death, towards the close of the seventeenth century, entitled, "De Motu Animalium." This remarkable work, wherein so much display of talent of the highest order is given, produced great advantage, especially to veterinary science.

Borelli's work exerted good influence on the progress of the study of physiology; more particularly so on that of locomotion; and it was in this that much of the value to, and influence on, veterinary science consisted, the value of horses depending on the relative state of perfection of their locomotive system.

Through a series of fundamental laws, which Borelli set forth, permanent advantage resulted, and the extension of veterinary science. Solleysel, in the same century, and more extensively still Bourgelat in the next, applied Borelli's theories, in their studies and descriptions of the action of the horse.

Solleysel, chief over the royal stables of Louis XIV., published his great work in 1664, entitled, "Le Parfait Marechal;" wherein he treats on the beauty, good qualities, and defects of the horse; the

art of shoeing, designed to restore bad feet and conserve the good, and on the general management of the horse.

This author exerted most valuable influence on the progress of the veterinary art in France at the right time. His position and large acquaintance which he cultivated with all authorities who had preceded him, with accuracy of observation, and lucid descriptions, prepared the way for Bourgelat, who in after time established the veterinary schools of France.

Our learned and respected contemporary, Dr Ercolani, in his "Critical Observations on Solleysel," says, "Of the numerous masters on horsemanship or directors of stables (Scudieri) who preceded him, or became his successors, I shall specially notice Solleysel only of this epoch, because all the others were of less account."

Solleysel, besides being grand master of the stables of the king, was a member of the Royal Academy, and esteemed by his contemporaries as one of the illustrious men in France of the seventeenth century.

Ercolani proceeds to say, "In his description of the diseases of the horse, Solleysel only brought into France that which the writers of Italy, on farriery, had taught before his time and since, with fewer imperfections in their method. In good faith, however, Solleysel confessed whence he drew his information, and highly lauded Ruini's work, to which he made frequent references. With much order and precision Solleysel taught horse-shoeing systematically, and the subject was henceforward well treated in France. He did not create a new, but illustrated and brought to perfection the system of Frederick Grisoni."

Ercolani continues, "If by his contemporaries Solleysel was ranked with the illustrious men of his time, by posterity he has been otherwise judged." Quoting from D'Arboval, where, in his Dictionary, article Veterinary, the author says, "Solleysel is still the oracle of those who mix in the art of treating horses, though he would only have been considered at this time a veterinary practitioner of little consideration. He was not wanting in spirit, had seen much, and copied much from the ancients; but how many imperfections are there not in his Parfait Marechal, how many absurdities, without counting the manifest errors and barbarous practices contained?"

Ercolani adds, "It is certain that Solleysel retained not a few errors, and taught not a few false doctrines."

Had Solleysel's great work been lost, instead of being available in every great public library, I should not find it necessary to search for more eloquent advocates in praise of his memory than the learned Italian author and the departed man's own countryman, whose words respectively I have quoted. Both authors agree that the hero of this notice observed much, copied much from the ancients, and brought to perfection some of their systems. Moreover, he was no plagiarist, but acknowledged the sources of his learning, and extolled the authorities he profited by. But, say both critics, Solleysel retained not a

few errors, and taught many barbarous practices. Properly interpreted, this means that Solleysel introduced much, systematised much, but that the life of one man, even as able, indefatigable, and in the enjoyment of opportunities, was not equal to the task of reforming and amplifying the whole sphere of veterinary science and practice.

Solleysel was the very man for the time in which he lived. He utilised all available material. The great anatomical work of Ruini, the systems of farriery published by Neapolitan and other Italian writers, were alike brought by him into France. I cannot conceive the possibility of a man working more or more successfully for veterinary science, and for the honour of his country, than Solleysel did, but for whom France would possibly not have had in the following century her Bourgelat; or what is more probable, Bourgelat would not have started as the founder of veterinary schools from the high ground he did.

I am thus brought to what may be called the third great epoch in the progress of veterinary science. Having briefly alluded to the Grecian and the Italian, we have now the French epoch inaugurated; and though this was the most important of all, and the greatest, because knowledge had accumulated, and, as has been shown, that of Greece had been brought to Italy, there augmented, when Bourgelat, owing mainly to his distinguished merits, but partly to the time in which his lot was cast, did more for the improvement of the veterinary art than any other man either before or since his time; in short, bold as the statement may seem to some, and difficult to prove as the proposition is, for my own part, I have no more doubt of the fact than I have of that of Richard Cobden being the greatest amongst the promoters of free commercial intercourse between nations.

Probably, in either case, the men made the opportunity, the materials for which lay in a forward state of readiness; and when once reform becomes inaugurated, and its necessity seen, new workers take it up, and more progress is made during the lifetime of a man than had been accomplished during centuries in his particular sphere.

As the founder of veterinary colleges, Bourgelat gave such impetus to the teaching, study, and practice of veterinary medicine in France, that that nation became acknowledgedly first, for its skilled practitioners, and particularly for well-trained artizans in that most important branch, the art of shoeing. To this happy result, which has saved millions of horses to France, while totally opposite measures have been the cause of destroying tens of millions with us, much was contributed by Solleysel and Bourgelat, who, in two successive centuries, proclaimed the importance, and contributed rules to raise the state of perfection in the art with the help of their contemporaries.

The succeeding and fourth epoch may be called, when viewed from an English aspect, the English epoch.

At the time Bourgelat was founding veterinary schools in France, we in England had, besides more horse amateurs than any other nation, at least one of the ablest anatomists of the horse.

George Stubbs published his great folio work in 1761.

To hold the balance justly, in comparing Stubbs's work with that of Ruini, we must look at time and circumstances, as we remarked in Bourgelat's case. It requires that allowance be made for the higher ground on which these last writers started, having the works of all who had preceded them for their guides and aids. All this granted, Stubbs notwithstanding, like Bourgelat, displayed powers, and the qualifications which give worth to power, not possessed by many of the pioneers of veterinary science noticed.

It is needless to advert to the too palpable fact, and say that our countryman, Stubbs, did not find the field prepared to receive the germs of a new system of veterinary science offered by him in his elaborate book, as his learned contemporary Bourgelat did in France. Stubbs's work was the embodiment of original knowledge, and I am convinced, from comparing some details of the work with the natural subject, that Stubbs's beautiful drawings were executed from admirable dissections done by his own hands; in no other way could the knowledge portrayed with such exactness have been acquired. Not only did Stubbs bequeath to his country the best work offered by any one man of any time on the anatomy of the horse, but his drawings were of a high standard, adapted to improve taste, whilst his text was so eloquently concise as to relieve the subject of its dry uninteresting character, which the study of anatomy is found to be by beginners.

There are not many incidents to call for notice, between the epoch just referred to and the next one, which is of most importance, viz., the time when "the London Veterinary College" was established.

Unlike the case in France, the opening of our college had not been anticipated by a native Solleysel, or equivalent to his contemporaries. Truly England had her Lord Pembroke, her Strickland, Freeman, and Richard Berranger, Esq. The last named had given a rich fund of information in his work on the history of horsemanship. Moreover, the English were a practical people, especially practically able horsemen. Alas, how much barbarous custom is allowed to pass under the designation of practical when theory or mind application is depreciated!

It does not come within the scope of this notice to refer to the incidents recorded with regard to the establishment of the Veterinary College at London, nor will it be profitably spent time to dwell on the brief space which the name of the first Professor, Sain-bel, occupies in the annals of veterinary science. The like may be said of Moorcroft's brief tenure of the joint professorship with Mr Coleman.

M. Vial de Sain-bel's death happening within a year after he took office as the first professor, and Mr Moorcroft's precipitate resignation soon afterwards, did not admit of either one or the other exerting any permanent influence on the future destiny of the college or the science and art of veterinary medicine, which the school was designed to promulgate.

For all practical considerations Mr Coleman must be regarded as the first professor of veterinary medicine in this country. Before his time the college had not got into working order, and the number of pupils who had attended were few, though some were of high standard, ranking amongst them Mr B acy Clark.

The time to write the history of the veterinary art in this country during Professor Coleman's career, and subsequently, has not yet, I believe, arrived. Historical questions are more dispassionately entered into at remote periods than at one approximating to the time of occurrences. I propose, therefore, limiting my remarks on contemporary occurrences to a few incidents, such as I consider stand in some relation to first causes.

All the great men mentioned in the preceding pages as marking epochs in the history of veterinary science, and others who brought almost equally marked influence to bear, were remarkable for belonging to the highest order of men for general knowledge and distinguished merits. All these men left works, either in manuscript or print, which have come down to us, and immortalised the names of their respective authors. The writings of these men afford the evidence of the work they did in their generation.

To pursue our inquiry by logical guidance, it is necessary, as far as we go, to trace from phenomena to results. In electing a professor to the London Veterinary College, an experiment was made which had never been tried before. It consisted in selecting a non-professional man, or rather a young man of another profession, a sister profession-grant, to fill the professional chair and preside over the veterinary school, practically and theoretically. Here we have a bold and unexampled experiment, and, strange to say, it was made at a time when the nation appreciated the importance of employing such masters of their art as a Nelson to command our fleets, and such brilliant experts in the science and art of war, as Abercrombie and Wellington, to lead British arms to victory. And yet a long neglected calling, or rather series of callings, all of the highest national importance, was given away with as little reference to consequences as if the subject was of no greater moment than that of appointing a doorkeeper to some public office.

All is well that ends well, and those from amongst the hundreds of members of the profession who, like the humble writer, became affected, directly and indirectly, under prevalent influences, say of their late Professor Coleman, "We ne'er shall see his like again!" These members are bewildered in wonder at the fortunate discovery of so clever a man at such a crisis, a man who knew so much of the world, and so little about the subjects he was required to teach.

No blame to Coleman. All shows the ordinary course of human affairs, when they drift on uncontrolled; still we have the fact and the consequences, and there is no getting rid of these.

Professor Coleman's teachings are not easily referable to, for the reason that he did not leave a book, or the material for one, to

afford posterity the benefit of his experience, or the means for a critical analysis of progress made during forty-five years of official responsibility. He compiled a book, which was published soon after he was appointed to the professorship, choosing for his theme the most important and difficult subject to master of any in the whole range of veterinary science and art. Mr Coleman's work on the structure and economy of the foot of the horse, and on the principles and practice of shoeing, is, I believe, the largest book on the subject ever published.

"The tree is judged by its fruit." Now, since Mr Coleman did not publish again, posterity will have to judge of the state of the veterinary art in our time by the complexity of writings which will be transmitted. Many talented men, by their innate tendencies, varied instruction, and readings, impart independent characteristics to their works. William Percival will be read, as Solleysel has been, as the expositor of the veterinary art in England in his age, and the works of many other writers will command attention in different measure.

Professor Coleman's life, teaching, and practice exerted influence specially over that department of the veterinary art on which he wrote, and which, throughout his career, he regarded with all its importance, meanwhile blindly believing that he understood the matter, and that his teaching was sound.

Unlike the different epochs in the history of veterinary medicine already referred to, to which the names of talented men, who devoted themselves spontaneously to the cause, imparted the features,—that which is marked by the founding of the Veterinary College at London lacked the man. Advertisement brought Mr Coleman, and high wages brought out his keen, mental energies, which were of a refinement that even great errors were methodically arranged, so that as a whole they became invested with the name of systems; yet these evaded penetration, and passed for genuine instruction. Bracy, Clark, and William Youat, devoted their money and strength in the cause of veterinary science, and so far have claims on the gratitude of posterity, that it was for the love of truth, and not for lucre, that they toiled.

When at some future time the history of veterinary medicine in England during this age is written, it will not be Mr Coleman's book of the end of last century to which reference will be made, but to those of his pupils. And it is worthy of remark, that on his favourite subject, "The Foot," and shoeing, the traces of the teacher's dictum will be found in full force in the works of his most diligent pupils,—"White's Farriery," the papers of the esteemed James Turner, one of Mr Coleman's most rigid followers, who, poor man, died just when he would have been the first amongst reformers. Whoever reads "Turner on the Foot," sees Coleman's doctrines intensified.

Descending farther in the inquiry, if the reader takes up a more recently published book "On the Foot of the Horse and How to Shoe it," he will find all the errors of Coleman and his immediate pupils,

combined, with additionally, not a few crotchets, extemporised by the author himself. Such is pre-eminently the character of the work by William Miles, Esq.

Fibrous Tumour growing from the Mucous Membrane of the Floating Colon. By GEORGE BOLLINGTON, M.R.C.V.S., Chesterfield.

CHESTERFIELD, *May* 11, 1865.

SIR,—A Mr Thorpe, of Clay Cross, a small town a distance of five miles from here, came this morning in great haste, requesting Mr James Martin (for whom I am acting as assistant) to go to his house and see a horse of his, which he said had got its bowels out, and was in great pain. Mr Martin accordingly went, and found what the owner had said was quite true; for the animal presented a most pitiable appearance, having about six yards of intestine hanging about his hind legs, which he was making vigorous but ineffectual efforts to rid himself of. It was at once apparent that recovery was impossible; therefore, the poor animal was immediately shot.

The cause of all the mischief was readily detected; for, owing to the intestines being, as it were, turned inside out, a large tumour was seen adhering to the lining mucous membrane of the *single colon*, and situated about three feet from where the latter terminates in the rectum. This body had evidently partially blocked up the passage of that portion of the alimentary canal, giving rise to abdominal pain and violent efforts at defecation, so as to forcibly expel a large portion of the intestines through the anal opening. I considered the case worthy of your notice; therefore I felt inclined to send you the parts, with a portion of the intestine attached, which I hope you will duly receive (per rail).

I think any remarks upon it by me would be superfluous; for you will be better able to give an opinion upon it than myself.

In conclusion, I will give you all the history that could be obtained from the owner, which you will, no doubt, think rather meagre. The horse in question was fifteen years old, good constitutioned, and had never ailed anything previous to this occurring. He ate his supper as heartily as usual last night, and appeared altogether to be in good health; but on his stable being entered this morning, he was found in the condition already described.

REMARKS.—The tumour received is in the form of an ovoid, attached by one side to the mucous membrane of the colon. Its long axis is parallel to the course of the gut, and, measured in this direction, it is over eight inches in circumference. Its antero-posterior diameter is three inches; its transverse, two. Its structure is fibrous, but of different densities at the opposite extremities, as well as at

variable depths, apparently according to the more or less remote date of its deposition. Nearly half of the mass is dense and indurated, and, comparatively to the rest, non-vascular. The greater part of the remainder, though also distinctly fibrous, is much softer and more vascular. Lastly, on the surface, is a covering of lymph recently exuded, and as yet non-vascular. This is in some parts over a quarter of an inch in thickness, and it extends over the whole of the walls of that portion of the colon seat. Microscopically, it shows the general characters of fibrinous exudation, having a great tendency to resolve itself into fibres, intermixed with corpuscular bodies. The tumour is connected by strong fibrous bands to the deep layer of the mucous membrane.

The large size and deep-red hue of the solitary glands render them very prominent objects on the mucous membrane of the portion of colon attached.

As the great mass of the tumour was evidently of long standing, it is curious that it should not previously have affected the health of the animal.

Mr Bollington has our best thanks for the very excellent specimen of such a rare affection.—ED.

Fractures of a Navicular Bone, following on protracted and a progressive diseased condition of the same, with altered condition of the Pedal Bone. By JOSEPH GAMGEE, Sen., Professor in the New Veterinary College.

To the Editor of the Edinburgh Veterinary Review.

ALDERSHOTT, *5th May* 1865.

SIR,—Allow me to offer Professor Gamgee my thanks for his lucid description of the diseased bones which I sent to him last month. I should have been still more obliged had he also alluded to the diseased tendon which accompanied them. I made no minute examination of the parts before sending them, feeling sure a full report would be given in your journal, for my and your readers' information. Perhaps a few supplementary statements of facts from me will not be considered either presumptuous or useless, in assisting those who care to consider this question, in forming an opinion upon the case; with this object only I venture to make them. When the horse first came under my observation, he was rising five years, fresh, and had done no work. I must repeat my statement that, up to the time of his becoming lame in June 1862, when he was only five years old, he had free action, and showed no symptoms of being infirm, but moved freely and well, and had only just finished his training. After the lameness the horse remained under treatment for upwards of two years, when he fell into a horse-slaughterer's hands, who used him a few times to draw dead animals. Did the fractures occur at the commencement

of the disease, *i.e.*, in June 1862, or subsequently to that date? Fractures at the seat of attachments of ligaments are unusual in bones previously free from change in structure. This horse was affected in June 1862 with *sudden* and permanent lameness, as previously stated, the seat of which was in some structure-forming part of the navicular joint, therefore I think the fractures and other diseased conditions in the bone resulted consequent upon the injury which produced the lameness at that time, so that Professor Gamgee's clear explanation of the way fractures occur in a foot previously diseased, does not explain either the first stage of the disease, (the point in question,) or furnish an answer to the questions I ventured to suggest in my letter. I am fully aware of the difficulty of solving questions, and do not expect him to commit himself by a premature answer, believing that if the Professor felt it was for the interest of the profession he would have replied to the questions. Professor Gamgee thinks that the horse did not suffer from rheumatism at all; we are all fond of seeing things in the way our preconceived ideas can best understand and account for. I cannot help thinking that the Professor was actuated, probably unconsciously, by this spirit, when he doubted my ability to diagnose rheumatism supervening upon a case of influenza, which was daily under my observation; for if he has really seen horses suffering from acute rheumatic inflammation of the dense tissues of the joints, &c., suddenly appearing in one leg, and as suddenly getting better to appear in another leg, with the acute pain in the spot affected, he will, I think, upon consideration, give me credit for the power to discriminate between rheumatism of the fetlocks, and effusion into them from diseased feet. Notwithstanding the Professor's doubts, I must assure him, and your readers also, that the horse was affected with rheumatic inflammation, quite independent of the foot disease; the latter existed some four months prior to the rheumatism, which followed influenza, during the convalescence, as is stated in my note of 11th April. Professor Gamgee will perceive this upon referring to it. I have not been able to find that I mentioned feet in either of my letters, and draw the Professor's attention to his remarks upon this subject.—I have the honour to be, sir, your obedient servant,

ALFRED J. OWLES,
Veterinary Surgeon, General Staff.

In replying to Mr Owles's letter of 5th May, in which he asks for more elucidation on the case reported by him, and commented on by myself in the last issue of the *Review*, I will make such further observations as, with some new facts given, seem to me to be called for.

Mr O. lays stress on my silence about the piece of tendon, to which, though it is very carefully preserved for any future reference if required, I did not and cannot attach any importance whatever in my deductions. To regard the condition of the synovial membrane

of a joint, when the bone over which it glides was found to be fractured in two places, in any other light than a dependent phenomenon in the sequence of changes, would be to mix up causes and effects, with the liability of placing the latter first in order.

I shall not dilate on the different aspects which Mr Owles's case has assumed, even historically regarded, to what appeared by the tenor of his note, published, which accompanied the pathological specimen. It now turns out that, instead of the case being one of sudden transition from complete soundness to incurable lameness, the horse was known to have been lame soon after he began work, two or three years before his death; that, in fact, he was bred, had lived and been fed for eight years altogether, without rendering the least service for the cost and trouble encountered.

Mr O. thinks that I dismiss his notion of the enlargement of the pasterns of both fore feet of the horse on insufficient premises; to which in reply, I beg to state that, without having seen the horse, some of the views I take are only published as opinions and offered as suggestions. Taking the history of the case, however, with its termination, we have ample grounds for showing much of what must have been the condition of structures before death.

Mr Owles submits the question, "Did the fractures occur at the commencement of the disease, *i.e.*, in June 1862, or subsequently to that date?" Why, most assuredly within a few days only of the horse's death.

I believe that when the crippled horse fell into the knacker's possession, the latter would use the animal regardless of the sufferings he endured, but after the navicular bone became fractured, as it did under exertion, the loose fragments of bone rendered locomotion and exertion impossible, through physical causes.

The case, as it appears to me, ran its course in the ordinary way, by which large numbers of the best horses in this country are constantly going to the dogs. Failing to prevent the occurrence of lameness in the first instance, or of making out intelligibly the cause after it occurred, it is, in the order of things, rationally viewed, that change of structures should succeed, as they did, and the consequences became inevitable.

I can, from my own collection of specimens, produce a hundred coffin and navicular bones variously changed from their natural condition, and about one-fifth of that number fractured, in various ways. These fractures are found to have happened at various periods before the horses were destroyed, in some complete and in others partial union of the fractures had become established.

Mr Owles hints that I have misrepresented him by saying that he mentioned two feet when he described the lameness of the horse; these are his own words:—"Subsequently to the lameness he had influenza badly, and rheumatism followed; the latter attacked *both fore fetlocks.*" Fetlocks I regard as regions of the feet, and intimately allied

in construction and functions to the parts immediately involved as the first seat of disease in the case.

Lest I may be accused of dismissing Mr Owles' theory on the rheumatic character of the affection without due consideration, I will remark incidentally that, in the account of the case referred to, I can see nothing to indicate the presence of rheumatism; and while I am not saying that horses are not subject to that disease—on the contrary, maintain that cases of it do occur, yet very rarely, and under peculiar complicated states of the animal economy—it is very important that questions of such magnitude should be abstractedly considered; only admit probabilities and assume the occurrence of phenomena, when there is hardly a possibility and no evidence of the occurrence, and all kinds of fancies will follow and loopholes for evading the truth thereby be opened.

There are few questions which have led to so much falsehood unwittingly uttered, as those relating to lameness in horses; and just in proportion to the extent of ignorance which predominates, so does evasion of the truth reign; instead of simple exposition of the matter with all the good which such a course would involve, only give more latitude to excuses and they will multiply; or do what alone would be to the right purpose, accept nothing that does not admit of clear demonstration, and then new inquiries and a new era in veterinary science in this country will begin.

The professional and commercial man are alike driven to shifts and violate the truth, when insufficient understanding on matters for their purpose is present. The absence of knowledge of the rules of arithmetic, and the value of the commodities he deals in, makes the merchant inexact and involuntarily unjust; while the professional man, from not being cognizant of real causes, extemporises false ones.

Apropos to the question of rheumatism in horses may be mentioned an incident which will be fresh in the minds of turf men. In 1855, Mrs Osbaldiston's horse, "Rifleman," was lame at Doncaster, and from that cause alone, it is believed, was unable to win the St Leger. Professor Spooner, being consulted at the time, declared that the horse was affected with rheumatism.

We have had the times when forefoot lameness of horses, into the characters of which men's minds had not penetrated, were passed off for shoulder affections, chest founder, &c.; and unless care be taken to check hastily extemporised notions, the burden will be found to have only been shifted from one shoulder to the other.

The difference between true and false representations of such cases, leads to the difference between the perpetuation of misery and loss, and that of going to the root of the evil and avoiding its consequences.

JOSEPH GAMGEE.

NEW VETERINARY COLLEGE,
8th May 1865.

TOWN DAIRY MANAGEMENT.

No more than a quarter of a century since the practice of town dairymen was to purchase aged cows, shut them up in any available shed, feed them for the production of a large quantity of milk, and breed from them. The life of a town dairy cow often extended over several years, especially when the feeder, having accumulated capital, was in a position to have a farm, where a certain number of cows could be kept for two or three months prior to the period of the birth of a calf, which was in its turn either to supply the veal market or attain the age of a breeding cow or a fattening bullock.

Contagious diseases were thus unknown. They first appeared about 1833; so that up to that period the cows in town sheds suffered simply from occasional accidents or local diseases. The most malignant affection was that observed in very abundant milkers after a long period of existence in the dark dungeons termed town dairies. That malady was phthisis or consumption—a disease rarely seen nowadays, owing to the rapidity with which young stock is killed out.

The lung disease—contagious pleuro-pneumonia—brought about a great change in town dairy management. A check was at once given to the accumulation of stock. Cows did not live to breed, and if purchased lean, were soon consigned to the knacker or the sausage shop. Breeding from town cows ceased; and whereas formerly about ten thousand cows would live on for three or four years in London, the same number barely survived ten months after the introduction of foreign plagues in the metropolitan dairies. The bulls which were once kept in the town dairies soon proved unprofitable, and the trade adapted itself by purchasing heavy, young, and fat cows ready for the butcher at any moment, when seized with illness. The mortality has attained such high proportions as to reduce to poverty those who did not alter their practice to suit a new state of things; whereas many discovered that farm cows for the first four or five months after calving always secured such an abundant supply of milk as to meet much of the loss entailed by disease. Milk dilution and other questionable practices soon enabled the dairymen of large cities to carry on thriving businesses, and accumulate wealth.

The diseases, however, continue. Cows which were once worth from £10 to £16, are now fetching from £14 to £30. The dairy and breeding districts of the country have been thinned. The veal trade has passed entirely into the hands of the foreigner, and instead of increasing our supply of fat stock, it has in no way kept pace with the country's requirements.

There are two means whereby hopes may be entertained of bringing about a beneficial change in these matters.

The first is by adopting adequate legislative means to check the progress of contagious disease, and compelling town dairymen to treat their animals in a proper manner.

The second and more promising method is by demonstrating how animals may be kept in health, and wholesome produce supplied at a cheap rate to the public. This demonstration can be readily and profitably afforded, to the great benefit not only of the milk consumers, but of the British stockowners generally, who have not yet learned how to deal with plagues which are constantly curtailing the farmers' resources.

A rational, enlightened system of farm and dairy management adapted to the wants of our growing population, would confer a lasting boon on British agriculture. It would economise our stock, spare more for breeding purposes, render the cattle-rearer's business less hazardous and more profitable, and enable us to produce a larger quantity of wholesome animal food than we can so long as the present management continues.

No trade is more profitable than that of a town dairyman. Were it not so how would the thousands of our cow-keepers have withstood the enormous annual losses they have sustained? These losses can with great certainty be curtailed; and I am not aware of any form of investment which will better pay than that of furnishing adequate capital for an improved method of town dairy management. What this should be may next engage our attention, and it is proposed to divide the subject under various heads:—

First.

a. Position and nature of buildings.
b. Breed and general character of stock.
c. Purchase and sale of stock, and method of preventing contagious diseases.
d. Feeding of cows.
e. Labour.
f. Collection, carriage, and sale of milk.
g. Distribution of manure, liquid and solid.
h. Method of testing the daily supply of milk.

Secondly.

a. Total expenditure in buildings, stock, &c.
b. Do. do. in feeding and management.
c. Do. receipts in trade.
d. General results.

I.

a. Position and Nature of Buildings.

It has been proved by the medical officers of health in the metropolis and elsewhere, that human health suffers from cow-sheds being permitted to remain in the heart of any large town surrounded by the houses of the people.

The advantages afforded by railways enable us to secure cheap ground apart from human dwellings, though the distance from town,

if possible, should not be large. In fact, suburban districts are sufficiently open to admit of proper dairies being established there, with a view to a direct supply of milk delivered, with the aid of horses and properly-constructed vans.

The buildings should include spacious, well-ventilated and properly-subdivided cow-sheds, divided into various yards. These must afford separate quarantine accommodation for newly-bought stock; a second yard for the first transference from the quarantine shed; and, lastly, the stabling for standing stock of cows. Proper stabling for horses and storehouses for provender are essential.

In addition to this, a large well-ventilated dairy, with proper utensils, ample provision for washing and scalding tubs, &c., complete the requirements. It is desirable to have space in the several yards, or adjoining them, for the movement of stock, and moderate-sized paddocks would be desirable.

Whenever a very extensive dairy is established, a manager's house and labourers' cottages would constitute a very necessary part of the buildings to be erected.

All the erections must be of a most economical description, and it is as undesirable as it is unnecessary to spend large sums in solid masonry. It is estimated, in round numbers, that five, or at most six, thousand pounds would cover all the expenditure in providing accommodation for a dairy of 1000 cows and its appurtenances.

b. Breed and General Character of Stock.

The best cows for town dairy purposes are cross-bred short-horns and pure Ayrshires. Some good Alderneys might be desirable; and excellent cows can be obtained from healthy districts in the north-west of France. There is no objection to Dutch and German cows, except that they would require great attention, with a view to prevent the introduction of the contagious maladies which it is our primary object to prevent.

As a rule, the standing stock of a town dairy should be large sized, of the best milking qualities, in fine condition, not lean or too fat, and of a hardy cross-breed. The pure Ayrshires, Alderneys, and other cows of choice small breeds, are specially useful for the abundant supply of a rich-coloured cream.

c. Purchase and Sale of Stock, and Method of Preventing Contagious Diseases.

Of whatever breed the cows may be, they should be purchased of mature age, rather young than old, and direct from the breeders. Public markets and fairs must be avoided. Healthy breeding districts should be alone resorted to, and the animals conveyed in special trucks thoroughly disinfected, and not with any train by which other cattle may be travelling. It is these precautionary measures at first which will enable any one to avert disease, and buy stock at the lowest price.

All the cows must be bought within a month, and usually within a fortnight, of the period of calving. The travelling is apt to bring on parturition, and when this does not happen, an opportunity is afforded to acclimatise the animal, and prevent that very common disease amongst well-fed good milkers, viz., milk fever.

The newly-bought animals should be subdivided into lots, varying from two to eight at most, in the quarantine sheds, and kept there not less than forty days. During this period, they should all be inoculated, and subjected to other special treatment for the prevention of pleuro-pneumonia.

The cows would then be drafted into the second yard of sheds, where they would also be kept in small lots, not exceeding twenty in one stable; and lastly, they would pass into the regular sheds, whence they would only be removed between the fifth and sixth month after calving, to be resold, especially to the country.

Any animal seized with sickness, however slight, should be instantly removed to special infirmary sheds, altogether apart from the establishment in which the general stock is congregated.

The early reselling of cows has been found to be the best policy in town dairies. The expense of accommodation and maintenance is too great to enable a town dairyman to keep on cows when yielding little milk; and in any healthy and properly-conducted establishment all the best cows should be permitted to breed and be sold to farmers who would keep them on to the next period of calving, when they might again return to the dairy whence they were drafted. The period of reselling varies much with different animals, but as a rule it should not exceed the sixth month from the date of calving.

Cows such as have been here described would cost on an average somewhat under £18 each, if Ayrshires; and foreign stock from healthy districts are included. Short-horn stock alone would be dearer, if of first quality, as it always should be.

The calves, amounting at least to 90 per cent. on the number of cows, would realise over head from 10s. to £1, and even more.

When the cows are resold, a deterioration in price of £3 or £4 might be calculated upon, so that the cost and loss on the stock would stand thus:—

Cost of 1000 cows, say at £20 each, . .		£20,000
Sale of 900 calves at 15s. each, . .	£675	
Sale of 1000 cows say at £16 each,	16,000	
	———	£16,675
Loss on Stock, ...		£3,325

It is not safe to calculate on less than 10 per cent. of casualties of all kinds, which would increase the loss on stock to £5325. This allows a wide margin, as it presupposes that all animals taken ill would die and prove absolutely worthless, whereas undoubtedly the majority would recover.

d. Feeding of Stock.

The staple articles of food in a town dairy must be draff, meal, (especially bean and palm meal,) turnips, grass, and straw.

The cost of keep in the vicinity of London would not exceed 14s. or 15s. per week for each cow, and, taking the largest sum, 1000 cows would cost £750 per week, or £39,000 per annum.

The keep of 16 horses required for the establishment would amount to £750 per annum, making the total annual expenditure in live-stock provender, £39,750.

e. Management, Labour, Collection, Carriage, and Sale of Milk.

Any extensive dairy requires a shrewd general manager, specially acquainted with stock in health and disease. In a company the expenditure attendant on a board of directors must be incurred. Labourers should be calculated at the rate of one man or woman to every six cows, at all events, for milking. In any district a large number of women can be secured, at a trifling weekly expenditure, to milk the cows, and by this means the cost of labour is reduced. This practice is in force in Edinburgh, Glasgow, and other large cities. Combining the expenditure of management and labour, it would amount annually to somewhat under £5400.

The cows would have to be milked twice daily, and the milk in part placed in the dairy, and in part taken off at once. In a large city like London, the sale of the milk might easily be effected directly and indirectly. In either case it would, as in Glasgow, be placed in corked barrels, with a patent stop-cock, so that no dilution or adulteration could be practised. Then either the milk is taken round to houses with a horse and van, or respectable agents are appointed in various districts for the sale of the milk. It may prove best to unite the two systems.

For the purpose of transfer of milk, not only are proper cans or barrels essential, but well-constructed spring vans, to prevent unnecessary jolting and churning of the milk.

1000 cows would yield on an average £61,000 worth of milk per annum. This is calculating the milk at 1s. per gallon, which is considerably below the London retail price.

The manure of 1000 cows can readily be distributed in any agricultural district, and would fetch £4504, 10s. per annum.

The Veterinary Review and Stockowners' Journal.

SHELTER FOR CABMEN AND CAB HORSES.

THE extent of service rendered to the public by the system of cab-letting in the streets of every considerable town in the kingdom, has become such, that no attempt to devise means for the amelioration of the condition of men and horses so exposed can be regarded as uncalled-for at the present time.

It is some time since our attention has been drawn to the evils which result to men and horses, and to cabs and carriages too, through the way they are exposed, day and night, to all variations of weather, in the metropolis, and every other town in the kingdom.

Like most other evils, this was easier seen and to be shown than the devising a remedy. In the last monthly number of this *Review*, on the last page, we reproduced from a contemporary a letter, addressed by a gentleman signing himself "A Mounted Officer," in which the writer shows himself to be fully sensible of the evil in reference to Edinburgh; and in a well-considered, concise formula, gives some hints for putting into execution a system of covered cab-stands; and after calculating the probable expense of providing accommodation for a given number of cabs, arrives at the conclusion that an annual rental of £1 per cab would cover the necessary expense entailed.

With modern inventions, especially since Sir Joseph Paxton has shown with what facility large spaces can be covered in, by means of iron and glass, at relative small outlay, and yet the structure be ornamental withal, the suggestion for covered cab-stands has become one of practical facility.

We have no need to enter on the architectural part of the scheme; and beyond offering one or two suggestions, we should not presume to advise on that matter.

Probably one of the obstacles to be met will be that of available sites in convenient parts of large towns; but against this it may be urged, that no more room will be required for covered stands than for exposed, open standing-ground; and virtually a cab-stand, with all its miserable associations, as at present, is the reverse of satisfactory to behold.

There are four aspects under which the general question may be taken into consideration, each affording scope for different faculties. Firstly, the men, their moral and physical wellbeing; secondly, the horses, their health and physical fitness for work; thirdly, the economy that covered stands would afford, in the diminished destruction of property which would result; and, lastly, the many ways by which the public would be the better served—dry and clean vehicles, dry and comfortable-looking men and horses; with the enjoyments which the absence of degrading cruelty brings.

As veterinary surgeons, our attention is naturally directed towards promoting the wellbeing of horses; as members of the community, we feel interest in the whole matter.

ROYAL COLLEGE OF VETERINARY SURGEONS.

THE Twenty-Second General Meeting of the members of the Royal College of Veterinary Surgeons was held at the College, No. 10 Red Lion Square, London, on Monday, May 1.—The President, Robert Lewis Hunt, Esq., in the chair.

Among those present, were Professors Spooner, Simonds, and Gamgee; also J. Wilkinson, Esq., the principal veterinary surgeon to the army. Messrs J. Allen, H. T. Batt, Charles Barrow, W. Bland, G. Bollington, Jas. D. Broad, T. D. Broad, G. T. Brown, W. Burley, Thos. Burrell, jun., Michael Byrne, M. F. M. Case, Jn. Carless, H. J. Cartwright, W. Cawthron, W. Cooper, W. F. Cooper, Jas. Cowie, Chas. Dickens, E. C. Dray, J. R. Dobson, R. H. Dyer, W. B. Edmunds, W. Ernes, W. Field, jun., Mr G. Flanagan, W. Giltro, Thos. Greaves, Jas. Hall, Mr G. Harpley, Edn. Harrison, M. F. Healey, T. P. Heath, W. Helmore, J. B. Henderson, C. Hunting, Thos. Jex, Jn. Lawson, G. A. Leppie, C. Lowe, Dl. M'Lean, Peter Moir, Jas. Moon, Jas. Moore, J. Moore, jun. R. Moore, R. Mosley, Chas. Percival, Rd. Pritchard, W. Pritchard, T. Rickaby, W. Rogers, Jas. Rose, Jas. Rowe, Alfd. Rushall, Thos. Sangster, W. H. R. Shaw, F. R. Silvester, Fk. Spratt, F. T. Stanley, Ed. Stanley, Mk. Tailby, S. Tremlett, Walker Watson, J. R. Williams, Jn. Wiggins, W. Wilson, S. H. Withers, Hy. Withers, Josh. Woodger, Josh. Woodger, jun., Ed. Woodger, T. W. Wragg, and the Secretary.

The Secretary, Mr Coates, read the advertisement convening the meeting, and also the minutes of the previous general meeting, which were duly confirmed.

The following report of the Council was then read:—

The motion for the adoption of the report was unanimously agreed to.

The meeting was addressed by Professors Spooner and Gamgee, Messrs Wilkinson, Ernes, and Helmore.

The President stated that the members of Council, who retired by rotation, were Messrs W. Burley, W. Ernes, W. Mavor, J. Legrew, T. D. Broad—and one in the place of Mr J. Ellis, deceased.

The following candidates were then proposed for election:—Mr M. J. Harpley, by Professor Simonds; Edn. Harrison, by Mr Lawson; C. Hunting, by Mr Dray; W. Ernes, by Mr Jex; T. D. Broad, by Professor Gamgee; E. C. Dray, by Professor Spooner; W. Burley, by Mr Withers; S. H. Withers, by Mr Harpley; Rd. Pritchard, by Mr Burley; Jas. Broad, by Mr Lowe; W. Mavor, by Professor Spooner; Jas. Moore, sen., by Mr Brown; W. Thacker, by Mr Wilkinson; W. Helmore, by Professor Gamgee.

Mr W. Pritchard and Mr C. Percivall were appointed scrutineers.

The scrutineers stated the result of the ballot to be as follows:—Mr Ernes, 53; Mr Harpley, 45; Mr T. D. Broad, 43; Mr Mavor, 41; Mr Pritchard, 40; Mr Harrison, 37; Mr Withers, 32; Mr

Hunting, 28; Mr Burley, 28; Mr Dray, 25; Mr Jas. Broad, 24; Mr Thacker, 23; Mr Moore, 7; Mr Helmore, 4; Mr Stanley, 3.

The President declared the following gentlemen to be elected: Messrs Ernes, Harpley, Broad, Mavor, Pritchard, Harrison, and Withers.

It was next decided by lot, that Mr Broad take the place of Mr Ellis, deceased.

It was moved by Mr Dray, and seconded by Mr Bland, that the thanks of the meeting be given to the President, for the very able and courteous manner in which he had conducted the proceedings of the day.—Carried unanimously.

The President returned thanks, and the meeting terminated.

The annual dinner took place in the evening; a large number of the members of the profession dined at the London Tavern, Bishopgate Street; Robert Lewis Hunt, Esq., the President, in the chair.

At the several meetings of the Court of Examiners of the Royal College of Veterinary Surgeons, the following gentlemen passed their examinations, received the diploma, and were admitted members of the body corporate.

STUDENTS OF THE ROYAL VETERINARY COLLEGE, LONDON.

April 24.—James Rumsey William, Caernarvon, North Wales; Charles William Clancy, Brownstown Lodge, Kildare; Robert Wilson, Wigton, Cumberland; George Colley Bland, Boston, Lincolnshire; William Reynolds Jermyn, Wymondham, Norfolk; George James Gould, Southampton; Julius Sauffer, Clapham, Surrey; Haydon Leggett, Southall, Middlesex; William Farmer Cooper, Great Berkhampstead, Herts; Edward Cooper Smith, Leamington.

April 25.—Henry Hobbs, Newnham, Gloucester; William George Flanagan, Reading, Berks; Charles Morgan, Wingham, Kent; Dive Millener, Sheerness; Alfred Adrian Jones, Ludlow, Salop; Edward Price, Birmingham; Thomas Fowler Hutchinson, Great Eccleston, Garstang; William Nicolson, Liverpool; William Northrop Proctor, Bradford; James Pulling Heath, Totness, Devon; Charles Houlden, South Somercote, Louth; William Chambers, Fakenham, Norfolk.

April 26.—William Wyer, Folkingham, Lincolnshire; John Young, North End, Felsted, Essex; Robert Ware, Seavington, Ilminster, Somerset; Edward Samuel Hewens, Hayes, Middlesex; Henry Newson, Lound, Lowestoft, Suffolk; Charles Barrow, Newmarket, Cambs.

April 27.—Thomas James Poulton, Coggeshall, Essex; Joseph Coates, Guildford; Richard Horner, Keighley, Yorkshire; James Trevitt Little, Liverpool; James Charles Bacon, Upper Clapton, Middlesex.

STUDENTS OF THE EDINBURGH VETERINARY COLLEGE.

George Armatage, Pensher, by Fence Houses; David Dudgeon,

Sunderland; William Allen Field, Newbury, Berks; Alexander Lockhart, Glasgow; Thomas M'Crorie, Monkton, Ayrshire; Robert Moore, London; James Green Paton, Manchester; Thomas Sharpe, Hamilton, Lanarkshire; Robert Wilson Sloane, Carsphairn, Kirkcudbrightshire; Frederick Wall, Manchester; David Young, Hamilton, Lanarkshire; George Young, Haddington.

STUDENTS OF THE NEW EDINBURGH VETERINARY COLLEGE.

George Bollington, Arhover, Chesterfield; William Bower, Ruddom, Norfolk; Walter Henry Bulmer, Alford, Lincolnshire; Middleton F. M. Case, Godmanchester, Hunts; James Connon, Forgue, Aberdeenshire; Thomas Douglas, Moneylaws, Northumberland; Benjamin Duff, Edinburgh; William Hunting, South Hetton, Durham; James M'Kenna, Belfast; John Porritt Rothwell, Bury, Lancashire; William Rowe, Coldstream; John Scott, Auchtermuchty, Fifeshire; Thomas Todd, Peebles; Thomas Wyche, Wilmslow, Cheshire.

STUDENTS OF THE GLASGOW VETERINARY COLLEGE.

Alexander Anderson, Glasgow; Thomas Campbell, Garlistown, Wigtonshire; Peter Findlay, Glasgow.

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE Sixth Quarterly Meeting of this Association was held at the Rose and Crown Hotel, Durham, on Thursday, the 11th May,—the majority of the members being present.

The President, Mr Hunting, occupied the chair; and among the various transactions, it was decided in future to hold the meetings at one o'clock, instead of four o'clock as heretofore, that hour affording greater facilities for members reaching home.

Six new members were enrolled, viz.:—Mr Matthew Hedley, Darlington; Thomas Plews, Stockton-on-Tees; William Hunting, South Hetton; George Hain, Newcastle-on-Tyne; William Allison, Thornley; William Hardy, Darlington.

On the disposal of the necessary business of the Society, Mr Farrow, M.R.C.V.S., Durham, complied with the call of the President, and brought forward the following paper on

PARTURITION.

Mr President and Gentlemen,—I have been requested, by the worthy Secretary of this Association, to bring forward at this meeting a subject for the consideration of its members. I consented to do so; not, however, with any promise that I could afford anything new or interesting. However, I hope that which I bring before you will open discussion, and cause many points of practical utility to be made known, and rendered valuable.

The subject of "Parturition" is one, I think, which has been greatly neglected by both writers and teachers of veterinary medicine. I have no doubt you will agree that it is one worthy of our consideration—one of importance to ourselves, and also to our employers.

It is not the ordinary cases of parturition that we are called upon to attend, but the difficult and extraordinary ones—cases that have proved utterly out of the power of farmers and others who have attempted to remove the cause. Under such circumstances, we labour against considerable disadvantages; and we require to possess great confidence, with a perfect knowledge of the subject, to enable us to deal with the case before us. This should be done promptly, without loss of time; for in all probability that time which would have proved the most valuable in effecting a removal of the difficulties, has passed away. This confidence and knowledge is best acquired by practice; yet, by discussion, the best methods to relieve in difficult cases may be brought forward, and a great amount of information gained thereby, each member adding a little to the general stock. This, I presume, will be the advantage we shall have on this occasion.

My remarks will be purely practical, and drawn from no other source than long experience in such cases. I feel less hesitation in addressing practical men, than I should do those not conversant with the subject. I know many of you must have had the same difficulties to contend with which has fallen so frequently to my lot.

I have said that we are not called upon to attend ordinary cases of parturition; yet, I am confident from long experience, that many valuable animals and their offspring would be saved annually, if we were consulted at the commencement of labour, in place of being sent for at too late a period.

There are five classes of animals that require our assistance,—viz., the mare, cow, ewe, sow, and bitch—to the whole of which I have been called to render assistance in protracted and difficult cases. I shall not, however, in this short paper attempt to extend my remarks further than the two first or principal animals.

The process of labour in all animals is attended with anxiety and pain, yet they suffer considerably less than the human female, owing to the formation in them of the parts connected with the transit of the fœtus; the horizontal position of the pelvis not requiring that form and construction so necessary to guard against abortion. Although they suffer less than the human species; yet in all there is a marked anxiety, restlessness, and, as the labour advances, considerable acute pains, which only cease with the expulsion of the fœtus.

In the mare this is a most rapid operation, and her exertions often the most powerful.

Her efforts, while they last, are attended with extreme perspiration, and in many cases also with extreme exhaustion.

In the cow these powerful efforts are not so well marked; her labour is slower and more protracted. She, however, requires more

frequently our assistance than the mare, and will bear up longer under protracted labour.

What, then, are the general causes of difficult parturition, so frequently occurring in the cow, and occasionally in the mare? They arise from various and very different causes.

First, From a want of that natural preparation of the parts through which the fœtus has to pass in its exit from the uterus.

Secondly, From a want of muscular power in the uterus, to press forward its contents, arising in consequence of over distention from unnatural fluid accumulation within the organ.

Thirdly, From morbid enlargement of the fœtus, either from unusual growth, dropsical states, or decomposition, when it has been dead some time before the process of expulsion has commenced.

Fourthly, From unnatural presentation of parts, whereby the fœtus cannot pass through the pelvis and external parts.

When the period has arrived for the completion of parturition, nature in ordinary cases prepares the way by a relaxation of the parts; and when the pains of labour commence, the mouth of the uterus also opens to allow a free passage from within.

In some cases this part remains undilated for some days, and generally causes considerable uneasiness on the part of the owner, who often attempts, or wishes to have the parts forced by an operation. This should never be done so long as the labour-pains continue. If they cease, or no improvement takes place, then we are justified in assisting the dilatation with the hand, but by no means with the knife.

Another cause of difficulty occurs from a banded state of the neck of the uterus, and is generally a very difficult one to overcome.

The muscular structure of the neck of the uterus feels like a band, or thick partition, stretching across one side, without any tendency to relax or give way. Such a condition can only be overcome by considerable patience, and continued pressure on the parts. Cases do occur, when there is no dilatation or opening of the os-uteri at the natural period, and the fœtus is not expelled for months after. I have met with many cases of this kind in the cow, but never in the mare.

In the second class of difficult cases—those in which exists a want of muscular power to expel the fœtus from the presence of a large quantity of water within the coverings—delivery is most easily effected by breaking down the membranes, and allowing the fluid to pass off; the fœtus is then to be brought up, and extracted in the usual way.

The mare is not liable to this state as far as my experience goes.

The third cause, or that which arises from extreme disproportion of the fœtus to the cavity through which it has to pass, in some cases attaining great size from over nutrition; in others from dropsical states of the head and abdomen, but more frequently from enlarge-

ment, arising from decomposition, when it has remained some time within the uterus after life has been extinct.

In all cases of this description, if there is no reasonable probability that the fœtus can pass through the pelvis and vagina, we must reduce its size by a removal of one or both limbs. To secure that end, so long, however, as life remains in the fœtus, every effort should be made to save it; but where that is doubtful, then our only duty is to save the dam if possible.

In the dropsical states, when ascertained, the exit of fluid affords instant relief. I have had cases of this description.

Fourthly, The next cause and most common are those that arise from a false or unnatural presentation of the parts. They are common to both the mare and cow, although much more frequent in the latter. The cause of this difference I am not able to account for, but it is met with in practice.

In all unnatural presentations it is requisite to replace the parts in the order as intended by nature. They should pass through the pelvis. Before any attempt is made to rectify a false presentation, all protruding parts, parts that have passed into the vagina or passage, must be returned into the uterus. In order to facilitate this operation, the patient must be placed in such a position that the hind parts may be raised considerably above the fore ones. This elevation will throw the fœtus back into the cavity of the womb, and by the change of position, afford considerable assistance to the operator.

The most common form of false presentation in the mare is the fore limbs, without the head, that part being turned on the shoulder, or under the breast of the foal. In the early stage of the labour, before the fluids have been expelled from the uterus, this deviation from the natural order can be rectified with little trouble by an experienced hand; but after that time, and when violent muscular action of the uterus is set up, it becomes no easy task to the operator.

Frequently the fore limbs must be removed before delivery can be accomplished.

The hind parts presenting, with limbs under the belly, is another cause of difficulty. The hind feet must be brought up before extraction can be effected. This is best accomplished by placing cords upon the legs, close to the feet, and then raising them while the hind parts are pushed forwards.

Another cause of difficulty arises from the hind parts of the fœtus becoming fixed in the pelvis, either from being too large to pass, or from the stifle joint becoming forced into the pelvis in a contracted position. It is then necessary to force back the fœtus into the womb, in order to extract it.

The treatment of the animal, after difficult labour, will be a stimulant in the first place, and next an opening drench. A strong embrocation of mustard and ammonia applied over the seat of the uterus, and a cooling diet, with gruel, will be the proper course to be adopted.

Having detailed a few of the principal causes of difficult parturi-

tion, I shall be glad to have the opinions of the gentlemen present, many of whom must have had quite as much experience in such cases as I have had.

A lengthened and animated discussion succeeded the reading of the paper, in which most of the members took part; resulting in the bringing together of many valuable opinions and details of experience gathered during continued practice among the animals referred to.

With regard to the greater prevalence of difficult cases of parturition in the cow, as compared with the mare, it was generally believed that such were the result of the varying outline of the rumen, and probably also from the common practice in these animals of "rigging each other."

Mr M'Gregor said he had found young Dutch and Irish cattle, after being landed here, very liable to false presentations in labour, which he attributed to the poverty and generally weak state of the system, together with the motion of the vessel during sea passage.

Mr Farrow was also inclined to the same belief, and added that excitement consequent on a voyage would also doubtless act with power towards the same end. A flock of ewes came under his observation recently, which, having been frightened by dogs at the time of parturition, presented the lambs in every difficult form.

Twisting of the uterus was advanced by Mr Dudgeon, which he believed was occasioned by rolling.

The best means to obviate such a state was freely discussed, it being the opinion of those most practically conversant with such anomalies, that a restoration to a natural position would be effected by placing the animal on the ground, and rapidly moving the body in a contrary direction.

Mr Armatage drew the attention of the members to those conditions of parturition in the mare, in which not only a false position of the fœtus was indicated, but there were unnatural size to contend with, most powerful muscular contractions of the uterus, and violent efforts on the part of the mare; such states were, in his opinion, remarkably important, and required great skill and energy.

In reply to these remarks, Mr W. Allison supported Mr Farrow in the principle of allaying the muscular contractions by bleeding largely, and administering powerful narcotics; and as a means of getting away the fœtus, considered it always more effective and rapid to get both the proper limbs into position rather than attempt to speculate on a withdrawal by one limb only, even should one be in the most difficult position,—under the body for instance.

If one extremity could be raised, he had no doubt of raising the other also.

Mr Hunter noticed the various forms of irregular contractions of the uterus which had come under his notice, and the inconveniences attendant upon them.

The question of removing the placenta was next freely taken up by Mr Allison, Mr Dudgeon, the President, Mr Farrow, and others, the general opinion being that in cattle little or no inconvenience arose from its remaining four or five days in the cow; but in the mare it should be removed, if not expelled, after the lapse of twenty-four hours. In the latter animal retention of the placenta gave rise to swelled legs and hocks, and great irritation, from absorption of the putrifying material.

Mr Armatage adverted to numerous cases which had come before him, in which, shortly after parturition had been completed in a perfectly natural manner, the animal would strain violently. The cause of this he had, in every instance, been able to trace to impaction of the third stomach, all other symptoms which accompany such a state being present.

It had mostly occurred at the first and second parturition, and among well-bred and highly fed cattle. Considerable variety of opinion was expressed as to the possibility of always being able to detect the third stomach by external manipulation in the right flank or per rectum; and the policy of relying upon such a proceeding as a means of diagnosis in these diseases.

A vote of thanks to Mr Farrow for his paper and the earnest manner in which he had sought to place before the meeting the results of his extensive experience in connexion with cases of parturition was moved by Mr Armatage, seconded by the President, and carried by acclamation.

The thanks of the meeting were also, as usual, warmly conveyed to the President for his services on the occasion.

The meeting was in all respects highly successful, and manifests the onward progress which the Society is making. Mutual confidence in each other becomes a greater evidence among the members; and the great value of such associations rendered apparent by the assistance derived from the discussion of such subjects as that brought forward by Mr Farrow and other members. The benefits thus derivable are capable of being reduced and applied to the everyday circumstances of each individual, which, when fully considered, are calculated to make one wonder that, being easily attained, we should have been content to remain so long without embracing those principles by which they can be invariably secured.

The next meeting will be held at Newcastle-on-Tyne during the month of July.

PERISCOPE.

PATHOLOGICAL ANATOMY OF GLANDERS.

By M. LEISERING, *Professor in the Veterinary School at Dresden.*

(*Bericht aus Sachsen*, 1862, p. 121.)

GLANDERS depends on a *neoplasm* of a special kind, which may be called the *Glanderous Neoplasm.* This neoplasm is the foundation of the malady, whatever may be its form, its seat, or its complications. All other characters and phenomena, whatever may be their importance and signification, for the purposes of diagnosis, or even on the life of the animal, are but accessory and secondary characteristics. Glanders ordinarily develops itself on the genus Equus only; but it can be communicated to other species, and especially to man; it cannot be identified with any other malady of these species. All veterinarians know its seat—that the neoplasm is met with on the mucous membrane of the respiratory passages, in the sinuses, the lungs, and in the skin, when it takes the name of Farcy.

Virchow, who was the first to examine the deposit of glanders, ("Handbuch der Spez. Path. et Thérap," t. ii. p. 1-408,) considered it as a prolification, or even a luxuriation, of cells in the connective tissue. Leisering looks on these cells as the essential elements of the glanderous neoplasm. They usually show a great variation in size; the majority resemble pus corpuscles; but many are twice, four, or even six times as large: there are also a few granulations, often with a glistening surface; lastly, beside the round cells are found corpuscles (the cells) of the connective tissue. According as one or other of these cell-formations predominate—according as one or other develops more strongly, or as one of the forms tends to disappear, according to the form assumed by the intercellular substance—there will be some differences on the glanderous neoplasm; it will represent at one time a consistent fibrous mass enclosing vessels, and at another a gelatinous (colloid) substance, having very little consistency. The more rapidly the neoplasm is developed, the more will the round cells predominate, and the less connective tissue will be found. Again, when the development is slow, the tissues affected by the neoplasm have little more vascularity than in their normal condition; whereas, if rapid, there is a considerable hyperhæmia of the surrounding tissues, and even hemorrhages into them.

The glanderous neoplasm agrees with other such new productions, in having neither proper cellular elements, nor an organisation that distinguishes it in an absolute manner from other neoplasms. That which characterises it is its place of election, its specific progress, and, above all, its contagious character. If we compare the glanderous to other neoplasms, we find, on the one side, a nodule, and, on the other, a granulating sore; the glanderous neoplasm being sometimes so closely related to the last that they are liable to be confounded, and have been by certain schools.

The glanderous neoplasm shows itself under the form of well-defined nodosities, or tubercles, and of infiltrations.

I.—GLANDERS IN THE FORM OF NODOSITIES.

This form of glanders is so exceedingly common that it has been considered as the habitual form of the malady, and thus at certain times it has been considered as a tuberculous affection. The nodosities vary in size from that of a millet seed to that of a pea, rarely more, unless they have been confluent, or when there is coexistent infiltration. They are usually angular in the lungs; elsewhere, they are round or oval. These nodosities are commonly met with in the lungs, where they are so frequent, that many observers believe they are to be found in every case. They are very rare in the sinuses, and the eminences developed there are somewhat differently produced, as will be seen when considering glanders by infiltration. In farcy, which may be called glanders of the skin, nodosities are found abundantly in the dermis; but they also extend more or less into the subcutaneous areolar tissue, where they sometimes attain to considerable dimensions.

All glanderous nodosities, whether situated in the lungs, nose, or skin, have similar histological characters. In the fresh state they are more or less soft and translucent,

with a reddish-gray colour; and at this stage they retain their proper vessels, as is seen in examining the tubercles of injected lungs. They may remain for long in this condition without undergoing further change, for they are often found in horses that have been long affected with glanders. At this time they are directly contiguous to healthy tissue; and it is only at a later date that a thin envelope of connective tissue is developed, which becomes a proper covering for the mass.

They may undergo a metamorphosis; they may become fatty, caseous, calcareous, or they may ulcerate; they are subject to the same changes as tubercle, properly so called. The fatty, caseous, or calcareous transformation of neoplasms in nodosities is especially common in the lung; but it may be observed elsewhere as well. It begins always in the centre of the mass, and extends towards the periphery. The calcification in the lung is sometimes so great, that it is easy to press out the tubercle from its covering of connective tissue. Ulceration, on the contrary, is most common on the mucous membrane of the respiratory passages and the skin; in this case, the neoplasm continues to reproduce itself as it is decomposed.

Whilst the middle of the nodosity softens by an abundant production of corpuscles resembling pus cells, which form a mass of detritus—whilst around the margins of the tumour new elements of connective tissue and rounded cells continue to be produced—these productions project from the surface of the mucous membrane, forming what are usually called ulcers; the depth of the ulcer, the base of the nodosity, being formed of the same materials as the borders. The ulcers result from the metamorphosis of the nodosities, have usually a rounded form, tend to increase in size, frequently become confluent, and lead to considerable destruction of the cartilages and bones. The ulcers of farcy attack the entire thickness of the skin, and do not affect the deeper tissues, unless they are developed from deep-seated nodules.

II.—GLANDERS WITH INFILTRATION.

This form is much less known than the preceding, so that a longer description will be given. The neoplasm is a fluid more or less gelatinous, of the consistency of mucilage; transparent, reddish, sometimes yellow or gray. It infiltrates the tissues more or less extensively; and it will require a separate study as existing on the respiratory passages, the sinuses, the lungs, and the skin.

(*a.*) It is very common in the mucous membranes of the nasal chambers, the larynx and trachea. There is no projection from the mucous membrane which is in a state of hyperhæmia, infiltrated and puffy, sometimes over an extensive surface, and sometimes in circumscribed patches.

The modifications it produces on the mucous membranes are of two kinds. In the one case the spithlon detaches itself over the portion infiltrated, and there is the production of the glanderous neoplasm the same as in the noduli, but with a predominance of spherical cells. These productions have not the same consistency; they are of a whitish tint, form a projection on the mucous membrane, and feel soft and velvety. When a mucous membrane affected in this way is placed in water, not only the puriform matter but also the product of the modified connective tissue is separated, laying bare the red and corroded bottom of the ulcer. These ulcers sometimes cover a square inch of surface, though oftentimes they are very much smaller. While the neoplasm is being formed, it has a great tendency to soften, and form a mass of debris. These ulcers are found in cases in which the malady assumes a rapid course, or when chronic glanders takes on the acute form. In the second variety, in place of softening rapidly, the neoplasm acquires a fibrous consistency; and after the detachment of the epithelium, or sometimes even before, the neoplasm presents a strong analogy to the tissues of a cicatrix; and these are generally considered by veterinarians as the cicatrices of ulcers. The productions of these pretended cicatrices have not been traced; and the study of their histology reveals that they contain the same elements as the pretended tubercle, the glanderous nodosity, only the connective tissue predominates. These neoplasms take their origin in the tissue of the mucous membranes, and the submucous cellular tissue, where they take various forms—stellate, spindle-shaped, &c. They are above all, numerous on the septum vasi; they vary from an almost microscopical size to patches several inches in diameter. This fibrous neoplasm has not always such a marked analogy to the tissue of a cicatrix, but projects in a nodular form from the pituitary membrane, or appears as a callosity on the mucous membrane of the trachea or pharynx. When parts affected in this way are plunged into water, the lesions do not disappear but increase in size, so as to render their texture more apparent. These neoplasms are white, bordering

on the red when they are rich in vessels. They sometimes show points of hemorrhage in the substance of the mucous membrane, and in the surrounding tissues. In the case of a simple wound or an erosion in connexion with catarrh, the epithelium is regenerated without producing a cicatrix or fibrous cord, as is seen in glanders. Even if the wound is deep, and a cicatrix is found, it consists of ordinary connective tissue, and does not contain the elements of the glanderous neoplasm. The pseudo-cicatrices in the course of the malady may soften and ulcerate like other glanderous productions; but this change is somewhat rare.

Can these glanderous ulcers or chancres be cured? and if so, what is the character of the resulting cicatrix? It is difficult to answer this question with certainty; but up to the present time superficial erosions only, and not deep ulcers have become cicatrised.

That form of glanders in which we only see elevations and pretended cicatrices is most tardily developed; the other symptoms are far from prominent; and there is apt to remain a doubt on the mind of the observer as to its real character.

We find them on the pituitary membrane, smooth patches depressed on the summit, and which appear to be neoplasms that have undergone a fatty transformation.

(*b.*) The mucous membrane of the sinuses is also a frequent seat of glanderous infiltration. Here, indeed, this form is alone met with, and not the nodosities or tubercles. When developed here, the mucous membrane is in a state of hyperhæmia; and in the submucous areolar tissue is a grayish colloid mass, containing the elements of the glanderous neoplasm, and particularly the cells allied to pus globules, fusiform cells, and granulations. Little by little the mass loses its transparency: vessels appear in it; and the intercellular substance becomes fibrous. The thickened mucous membrane becomes indurated, bulges irregularly, and takes on an aspect known to be characteristic of glanders. Besides the neoplasm of the connective tissue, there may be developed an osseous neoplasm, osteophytes, productions which are not, however, characteristic of glanders. Neoplasms in the sinuses seldom soften and ulcerate.

(*c.*) Lungs affected with glanderous nodosities are usually infiltrated as well, though sometimes to such a limited extent, that it is not observed. It is noticed above all towards the free borders of the pulmonary lobes, and immediately under the pleura, though sometimes they exist in the parenchyma. This form of glanders has a resemblance to lobular pneumonia, and thus has proved a source of confusion. The pulmonary tissue is first impregnated with a yellow gelatinous mass, and the surrounding parts are in a state of hyperhæmia. Soon it changes, and if the spherical cells predominate it becomes hard, and resembles gray hepatisation. These neoplasms, which may acquire very large dimensions, are susceptible of undergoing the same metamorphoses as the nodosities; they may soften, but more commonly they take on the caseous or calcareous change. If, on the contrary, the connective tissue predominates, nodosities of a fibrous texture are met with, which compress the pulmonary mass. The surrounding parts are abnormally vascular, whereas the contained mass is destitute of blood. There are often fibrous prolongations of the neoplasm, which, under the pleura, present similar characters to those of the pretended cicatrices on the pituitary membrane. Sometimes pleural adhesions are met with, due to a secondary inflammation.

Lastly, the glanderous infiltration often exists in the skin and subcutaneous areolar tissue. Around the nodosities or farcy buds, it is ordinarily infiltration of the dermis, and particularly of the cellular tissue, and may be prolonged into the muscles beneath. The yellowish, translucent, humid, and purulent-looking masses so often observed in farcy, are only the analogues of the infiltrated parts of the lung tissue already mentioned. Under the microscope it shows cells similar to those of pus, cells of connective tissue and granulations, as in other glanderous neoplasms; they submit to the same modifications, being transformed into an abscess when the cells abound, or into hard *buds* when the connective tissue predominates.

This description refers to glanders in the chronic form chiefly; but it is probable that, in the acute form, the new productions are identical. Leisering was unable to get specimens so early in the disease as to allow a satisfactory examination of the intermaxillary tumours, so as to ascertain whether they are veritable neoplasms, or simply a secondary alteration of the lymphatic glands. Whilst he has never seen nodosities or masses by infiltration, it is probable that the caseo-calcareous masses observed in the intermaxillary and other glands, has an origin analogous to the neoplasm of the lungs.

For glanders there must thus be admitted a special neoplasm, approaching the

character of tubercle, but as distinct from it as are the simple granulations of diphtheria. It does not any more approximate to syphilis of man, the essence of which is a special neoplasm—chancre. Leisering argues with Dupuy in admitting a specific morbid alteration of the cellular tissue, giving rise to the production of hard calcareous tubercles, with a tendency to ichorous suppuration. Virchow equally admits a morbid alteration of the cellular tissue. The learned professor at Berlin, Fœrster, and others, admit that the glanderous neoplasms of the nose own their origin to the luxuriation of elements of the connective tissue of the mucous membrane and submucous tissue. Now, the same thing is observed in the case of the tubercles of the lungs, and even in glanderous infiltrations. It is notably in the injected pieces of the lungs that we can convince ourselves that the neoplasm commences only in the interstitial connective tissue.

A specific irritation provokes its formation. In most cases this irritation is known, not chemically or microscopically, but by its power of communicating itself by its virus. If this virus is brought into contact with the mucous membrane or skin, and affects these, local alterations are first seen, and afterwards affections of the lymphatic system. This is analogous to the operation of the virus of syphilis in man.

Once a single neoplasm is produced by contagion in any part of the animal body, there exists in the affected individual a source of glanderous virus which it would be difficult to dry up. This virus, conveyed by the humours from place to place, provokes, in the places of election, new neoplasms; and it may even be communicated, like syphilis, from the mother to the fœtus. But that the lymphatics charged with conveying the virus are often violently inflamed with effusion into the surrounding areolar tissue, &c., there is no ground for concluding that glanders is an affection of the lymphatic system. The same alterations in the glands and vessels are observed in other maladies. Glanders cannot be considered as a disease with alteration of the humours, though the humours may be charged with carrying the virus.

The glanderous virus does not need to be inoculated or to enter the blood-vessels; it may be conveyed by the atmosphere to the respiratory passages or the skin. M. Leisering leans to the idea that glanders is always due to contagion, though he does not altogether deny the spontaniety of the affection.

THE MALT TAX.

(*From the Times of Saturday, March* 4.)

The literature of malt threatens to become oppressive. No question of the remission of tax arises but we are overwhelmed with pamphlets and papers for and against the alteration. Last year Mr Gladstone pathetically confessed that he had struggled long and hard to keep abreast of the flood of publications on the sugar duties, but was overcome a good fortnight before the opening of his budget. This year he has to meet a similar tide, and will probably experience a similar fate. Every day brings its speech, letter, or other argument, the greater part of which tends unfortunately only to darken knowledge. The last contribution to the literature of malt comes, however, from a department of the Administration itself, and is an exception to the general rule. The Board of Trade has issued a very valuable report on the value of malted barley as food for stock. Excited by the allegations that cattle could be fattened cheaply on malt, and that the abolition of the malt duty would so far reduce the price of beef that we might dispense with the importation of *charqui*, Mr Milner Gibson has had a series of experiments tried to test their truth. Oxen, cows, sheep, and swine have been carefully selected and subjected to courses of feeding under circumstances precisely similar, except that for the malted barley supplied to one division or group, the same quantity of barley unmalted has been supplied to another. The results have been a terrible commentary on the vanity of theory. In spite of agricultural chemists, Mr Banting, and the fattening qualities of sugar, the beasts fed on the unmalted barley fattened, on the whole, better than the others, and the supposed superior virtues of malt are altogether discountenanced.

The agitators for the repeal of the malt duty must confess the importance of these results of experiments, which appear to have been conducted with perfect fairness. Until something is done to explain them away, the chance of successful agitation is but slight. The malt duty, considered as a tax on beer, is a very moderate impost;

on an average it does not amount to more than one-eighth of the selling price of beer, and the duty is, therefore, less onerous to the consumer than the duty on tea, the duty on coffee, or the duty on sugar. But if malt is capable of any other use than as an ingredient in the manufacture of beer—if, for instance, it is of any especial value as food for cattle, the duty upon it may well be oppressive. This was the single point which was effectively made at the meeting in the Freemasons' Tavern. After the county members had discharged their harmless thunder, two or three tenant farmers of plain good sense argued against the duty as a hindrance to the feeding of stock, and one of them asserted that by the use of malt he could have obviated the ill effects of last year's drought, had not the Board of Inland Revenue intervened. The farmers in question made no wild promises of cheap beef, but they spoke with some assurance of being able to reduce its price 2d. a pound. The experiments made by order of the Board of Trade must scatter these pleasing visions. We can no longer believe that anything can be done with malt which cannot be better done with plain barley. Mr Lawes, the well-known agricultural chemist, who seems to have conducted the experiments for the Board of Trade, took two samples, each of seventy quarters of barley, the first of fair malting, and the second of fair feeding quality, and he malted and screened half of each sample. He had thus four parcels—two of malt and two of barley—with which to carry out his plans. The subjects of the feeding experiments were twenty cows, twenty oxen, each divided into two lots of ten, sixty sheep, divided into lots of twelve each, and forty-eight pigs, divided into lots of eight each. The animals were selected so that those in each class should be as far as possible of the same size, breed, and constitution; but, to make the trial fairer, they were put under a process of training before they were subjected to the final and perfect experiment. Thus, the twenty cows were selected, weighed, and placed apart, and for a fortnight each received exactly the same food of cake, meal, chaff, and swedes. At the end of the fortnight they were weighed again, and definitely divided into two lots, and the exact experiment began. For ten weeks the cows received the same food as before, except that each of the first lot received 3 lb. of the fair malting barley daily instead of 3 lb. of rapecake, and each of the second lot received the malt and malt dust produced from 3 lb. of the barley instead of the rapecake. No exception can well be taken to the experiment as thus stated, and the experiments with the oxen, sheep, and pigs were almost identically the same. The only difference was that feeding barley was substituted for malting barley in the case of the oxen, and the greater number of the sheep and pigs allowed experiments to be made with mixtures of malted and unmalted barley. The barley and malt were crushed in all cases except that of the pigs, when they were coarsely ground. The animals were weighed at regular intervals during the progress of the experiment, and the milk of the cows was weighed daily. At the close of the experiment the fattening animals were killed and their carcases weighed and examined. The results almost uniformly showed greater fattening qualities in barley than in malt; the difference was generally slight, but it was quite perceptible. The only decided exception was furnished by the cows, which fattened better, but, on the other hand, yielded less milk, when dieted upon malt. Even here the advantage was very small; the average weekly increase per 1000 lb. of live weight was 6·28 lb. in the case of the malt eaters, against 6·17 lb. in the barley eaters, while the milk yielded weekly per 1000 lb. of live weight was only 137¼ lb. against 146 lb. The lactometer invariably showed also a higher proportion of cream in the milk got from the barley-fed cows. The results where mixtures of malted and unmalted barley were tried were equally favourable to plain barley; the sheep and pigs fed on this last fattened better than those dieted on malted barley, or on a mixture. The quality of the stock when killed led to the same conclusions. The barley-fed oxen were more even in quality than the malt-fed beasts, some of which were decidedly superior, but others as decidedly inferior to their rivals. The sheep showed little variation, but among the pigs those fed on barley were in much better condition and of much better quality than those fed on malt. The worst pork was got from the pigs fed on the malt made of the good malting barley.

It will not be very easy to get over these results of actual experiment. A given weight of barley is shown to be more productive of milk in cows, and of beef, mutton, and pork in fattening stock, than the same weight administered in the shape of malt and malt-dust; and in considering the economic advantages of the two kinds of feeding, the cost of malting must of course also be taken into account. The fact is remarkable, and is perhaps a little opposed to our antecedent notions of probability, but theory in such a case must yield to experiment. It may at once, however, be conceded to those who will be reluctant to receive the results of Mr Lawes's investigation,

that there may always be found exceptions to the general truths he has deduced. We know after all very little of the chemical and vital forces by which food is converted into flesh, and the proverb "One man's meat is another man's poison" is true of beasts as of men. One of Mr Lawes's malt-fed cows increased very largely in weight, falling off at the same time in milk to an equal extent, while one of his barley-fed cows actually decreased in weight during the progress of the experiment. But whatever value such exceptional cases may have for the fancy breeder as hints for the management of young or delicate stock, they cannot be regarded by the legislator. He must act on a large average, and it is evident enough that there is no case made out for reducing the malt duty in the interest of beef and mutton. Malt can, however, only be used as food for cattle or as an ingredient in making beer; and if malted barley is absolutely less useful than unmalted barley in fattening stock, the duty must stand or fall by a comparison with the duties on other beverages. There are, of course, disadvantages incidental to the duty, as there are to all duties. It may occasionally discourage the sowing of land with barley when such a course would be convenient to the farmer; and it undoubtedly operates as a premium on the best and a fine on inferior barley lands; but no tax can exist which is not open to many objections. It is possible that the beer duty should have been retained in preference to the malt tax, but private brewers could not easily be brought under its operation; and, though public brewers are wealthy, they would doubtless remonstrate against any reimposition of the tax upon them.

BREEDING OF HUNTERS AND ROADSTERS.

(*From the Scottish Farmer.*)

SIR,—Having for a great many years taken a deep interest in the breeding of horses for the road and field, I read with much attention two papers lately published in the *Scottish Farmer* on the "Breeding of Hunters and Roadsters," the deteriorated state of the breed, and the scarcity of first-rate animals in these two classes. Although agreeing with the writer in the main points of his argument, I beg to differ from him in several particulars. He justly observes, that no reason exists in the lack of eager and enthusiastic sportsmen; that the glorious and exciting sport of fox-hunting has lost none of its attractions, is fully evinced by the large fields that turn out, and the pluck and endurance they show in many a clipping run. There is also truth in the writer's assertion, that a great many breeders do not exercise proper judgment in the selection of both sire and dam, and are too stinting of good keep. In this, however, there is nothing new; it has been the case ever since I can remember anything about the breeding of horses, and it is only natural to infer, that as we are progressing favourably in other matters connected with the science of agriculture and rural economy, we do not retrograde in this.

My opinion is, that there is really no deterioration in the breed, so far as quality is concerned, but there is certainly a marked decrease in the number bred; and the true reason is, that the breeding of such horses generally *does not pay;* at best it is a very slow way of making money. Hunters do not only require to be bred, but to be thoroughly made before one can command a high price for them, and this involves a great amount of time, risk, and expense. Besides, not one breeder in a hundred is capable of making them himself; and breeders generally are compelled to sell the most promising young horses to dealers or middle-men, who, if they exercise good discretion, are better paid than the breeder by at least 50 per cent.

Of late years also the breeding and feeding of cattle and sheep have been much more remunerative, turning over money a great deal quicker, at less risk; and hence so long as the relative value of cattle, sheep, and horses remains as it is, there will be fewer of the latter bred.

That the breeding of half-bred horses will not pay, under any circumstances, I would by no means argue; but people who do not exercise great judgment had better not breed at all. I endorse your writer's assertion, that great care should be observed in the selection of the dam, as she exercises even greater influence on her progeny than the sire. She ought to be a lengthy, low-legged, deep-ribbed animal—a good mover, with good temper, good constitution, great substance, and free from all natural infirmities. I would consider *one* mare of such a stamp, if judiciously crossed,

and her produce well attended to, as likely to pay her way on an ordinary-sized farm, or *two* at most. By not having too many coming into work at the same time, a man has a better chance of selling a really good horse, if he be fortunate enough to breed one, to the greater advantage. Your writer deprecates the practice of breeding from old mares, which, he says, invariably breed "slugs." In this I cannot coincide with him. Some horses and mares of good constitution preserve their functions unimpaired even to old age, and transmit them to their progeny. This we have seen in the case of "Blinkbonny," bred from a middle-aged mare and an old horse, and many others equally striking. He says, the best age to put a mare to breed is at six or seven years old; but surely he forgets that such as he describes would at that age be a very expensive brood mare to begin with, worth at least three figures. I would not object to such a mare after she had carried a heavy weight to hounds, without her legs giving way, till she had entered into her teens or got disabled by accident. She would then have her muscles more fully developed, I should know what she was made of, and, if her produce did not belie her promise, I should certainly not discard her so long as nature proved she was capable of propagating her species.

In selecting a sire, I would prefer him with purity of blood; would look less to large frame than to style and symmetry, and less to speed than to power and endurance. If a race-horse, I would prefer one that had carried heavy weights, run long distances, and trained on to six or seven years old, sound in wind and limb, to an infirm horse that had made the most brilliant career on the turf as a two-or-three-year-old; but would not object to a horse too slow for racing on the flat, provided he possessed stamina and good staying blood; such a horse would be likely to produce hunters quite fast enough to live with hounds across a severe country.

Your writer indulges in some theories about country stallions, which I think he would find some difficulty in reducing to practice. I cannot coincide with his idea of reversing the present order of things, and, instead of charging double price for thoroughbreds, either charging double for coarse agricultural mares or prohibiting his horse from serving them at all. The first alternative would be impracticable, the latter unprofitable; besides, some of these mares, if of a good colour and put to a horse of fine quality, might produce a good carriage or drosky horse, which sometimes pays as well as a hunter; and at the close of the season the owner of a country stallion has usually a very small margin of profit after taking all he can get, *rag-tag* and *bobtail*.

Lastly, the writer of the papers alluded to recommends, as the easiest and most likely way of remedying the evil he complains of, that country gentlemen in each district should purchase first-class stallions, and put such a price on their services *as farmers will pay*, looking for remuneration not to their services, but from the higher class of young stock they would be able to purchase. I object to this *in toto;* because it would be acting foolishly to dispose of one's property below prime cost; and even were one inclined to indulge in such philanthropy, it would, I am afraid, be misplaced. It would just be an inducement to others to bring horses into competition with him of an inferior stamp, with which they would still contrive to undersell him, as it is notorious that with many breeders cheapness and convenience will always carry the day. Were country gentlemen to bring really good horses into the country it would be a great boon to breeders, even if offered at a fair remunerative price. Good breeders would not grudge this, and if others, from false notions of economy, still preferred using the *screws* with which the country is infested, by all means allow them to pay the penalty of their parsimoniousness, and breed "weeds."

—I am, &c., JOHN USHER.

GOITRE IN THE DOMESTIC ANIMALS.

By M. BAILLARGER.

THIS is a paper read to the Academy of Sciences on goitre, as observed in the domestic animals in Savoy and Isere. It sets forth, contrary to the opinions of some veterinary writers, that in districts in which cretinism and bronchocele prevail, the latter is very common in the lower. It is especially common among mules,—a curious circumstance, as these animals are well known to be unproductive, and a marked feature of cretinism is infertility. Out of thirty mules examined in Maurienne, twenty-three were affected with bronchocele, the thyroid body being enlarged to the size of a hen's, or even a goose's egg.

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DIFFICULT PARTURITION IN A MARE.

By M. G. Canu, *Veterinarian at Zorigny-sur-Vire.*

In this case the mare had been in labour for some hours, the waters had escaped and yet nothing presented. The hand introduced into the vagina caused extreme violence of the labour pains, so that it was impossible to render any assistance. The mare was largely bled, and it was ascertained that the loins were presented, the back being greatly bent; but for an hour all efforts at turning proved fruitless. The intestines of the foal now appeared at the valva, the walls of the abdomen having given way. The whole abdominal viscera was now removed, and as the union of the vertebræ between the dorsal and lumbar appeared to be giving way, their disjunction was completed by the aid of the knife. Other measures having failed to make any improvement, traction with a hook and cord were employed. In this way the two first lumbar, and the last dorsal vertebræ, with one pair of ribs, were brought away. The hook was now placed in the thigh, and the femur separating from the acetabulum, one hind limb was removed. By means of a couple of hooks placed in the innominate bone and the sacrum, the hind extremities were now withdrawn. After resting for some time, the four limbs were sought for, brought into the vagina, and she had got into position above them. Cords were attached to the feet and the lower jaw, and by the united strength of five men the remainder was drawn through the tumefied and blackened vagina.

The mare which, in the latter part of the operation, had fallen from exhaustion, was now covered with straw and a thick cloth, and given tepid liquids sweetened with honey, injections, a warm bran poultice over the loins, and astringent applications to the vagina. In two days she was up seeking for food, and on the twelfth day was put to work.

PETRIFACTION OF THE PERICARDIUM.

By M. Vernant, junior, *Clamecy.*

This remarkable specimen, allied, as M. Vernant believes, to calcareous phthisis affecting the heart, has probably no analogy except in some remarkable cases cited by Gurlt, and by some Mecklenburg veterinarians. The heart examined out of the chest was not recognisable. It is a voluminous mass, in the form of a quadrangular pyramid, with the summit inferiorly and truncated. The transverse diameter at the base is greater than the distance from base to apex. It weighed over 40lbs.

The calcareous covering enveloped the whole outer surface of the ventricles, covered the superior part of the heart, the aorta, and pulmonary artery, and formed rings round the openings of the vena cavas. The auricles were lost in a calcareous mass of great thickness, particularly on the right auricle.

The calcareous deposit appears to exist in the substance of a fibrous membrane inside the pericardium, and most intimately attached to it throughout. The fibrous sheath is white opaque, having the appearance of a lardaceous fibrous tissue, and very resistant to the knife. The whole of the tissue is filled with irregularly-rounded masses varying in size from that of a small pea to that of the closed hand. The smallest of these are easily pressed out, leaving a cavity with smooth glistening walls like the surface of the mass. The deposits are yellowish, very thick, and between the fingers feel hard and resistant, presenting, in fact, all the characters of the deposits in the lungs of cattle suffering from calcareous phthisis. It was continuous with the muscular structure of the heart at the anterior and posterior borders, at the extremities and lateral aspects of the auricles, but very loosely connected with it on the lateral aspects of the ventricles at the apex and the coronary furrow. The substance of the heart itself was of the natural size and weight.

The apex of the heart was turned more forward than is natural, and the muscular structure was unusually pale. No lesion of the lungs or other structure was observed.

It is curious how the normal movements of the heart could take place in such an unyielding envelope. All that was known of the bullock from which it was taken was, that it was brought to the abattoir in excellent condition.

THE STUD BOOK.

To the Editor of the Sporting Gazette.

SIR,—A letter from Mr Goodwin, which appears in your *Sporting Gazette* of last week, headed as above, has arrested my attention; and I am thereby induced to ask you to allow me space for a few remarks on the same, and its relative questions.

The writer alludes to the circumstance of Fille de l'Air's name not appearing in the English *Stud Book*, while the names of other horses, bred, like her, abroad, though less distinguished for merit, are found duly registered. As no cause is made apparent for the omission in Fille de l'Air's case, nor time elapsed for explanation to be given, it may probably turn out to be merely accidental or inadvertence, to which the omission of the mare's name is to be ascribed, and I shall therefore not dwell on that topic.

Another question, however, of greater moment, is raised by Mr Goodwin, which has long occupied my attention, and therefore I readily fall in with your correspondent in the discussion. I allude to the exclusion of English horses from the *Stud Book* for all time, whose progenitors can be shown to have run as half-bred; while any slender and inferior animal, coming from the non-European shores of the Mediterranean, has his or her place at once allotted in the general *Stud Book*, side by side with those of the stoutest and best horses in the world. Mr Goodwin cites the high authority of Admiral Rous, who says, that "Any horse good enough to win a class of the Nursery Stakes, or a race of the same importance, should be entitled to a place in the *Stud Book*." This plain exposition of such sound doctrine requires no comment.

That the jealousy with which the descent of the English blood horse has been regarded for more than two centuries has been effectual in establishing the best breed of the class anywhere to be found, cannot, I think, be denied; still I believe that some slight modifications could be conceded by the Jockey Club which would lead to good results, without incurring risk to the purity of future descent; but, on the contrary, an occasional source of new stamina would be attained. It can but appear anomalous, even to Englishmen, who, going far to see the Derby, find at times the letters "h. b." appended to the name of a competitor in a race which is allowed to afford the highest test of merit amongst the horses of any given year, of a verified age, of any in vogue. *Apropos* to my argument may be related an incident which occurred in 1849. An Italian nobleman, who came over to England and saw the Flying Dutchman win the Derby, said to me some time after—"He was very closely pressed at the end by a half-bred horse, and only just managed to beat him." Not foreigners alone, but many Englishmen, imbibed a prejudice against The Dutchman, one of the best horses of our time, through the same circumstances; and, by comparison, all the best horses in that race were depreciated, while the so-called half-bred was in that respect on an average with the others.

I beg now to draw attention to a horse, whose name would confer as much credit to the *Stud Book* by its presence as he would derive from the conceded position. I allude to the Lawyer, a well-known horse, bred by the late Sir Tatton Sykes, got by the Libel out of a mare by Hampton, said to be half-bred. Mr Eyke states in his advertisement that the Lawyer won thirty races, including seventeen Queen's Plates; and that he won his races over all distances, from one to four miles. We also know that during his career the Lawyer met the best horses on the English and Irish turf. According to Admiral Rous's sage ruling, the Lawyer has done much more than enough to win his way to nobility amongst horses. What about his breed? I go with the authority just named; and if a horse fell from the clouds, and proved himself to be one of the best in the land, I would send him to the place of distinction which he had gained.

As to breeding, since neither the Lawyer nor his lineage on the dam's side is to be found in the *Stud Book*, I will relate a circumstance which may to some extent prove relevant:—In May 1857, in compliance with a request made to me by Mr Boulton, of Oxfordshire, I undertook to purchase for this gentleman two brood mares, and prevailed on the late Sir Tatton Sykes to sell me two which I selected from his stud, with their foals, then six weeks old, with them. One of the mares was sister to the Lawyer's dam; the foal at her foot, a filly, was by Young Barefoot, and she, as well as the sister to her, had been put to the Libel. The result was the brown colt, since called the Lawyer, in one case, whilst the mare I bought proved barren in 1858.

On making particular inquiry into the history and breeding of the mare I had bought, whose name did not appear in the *Stud Book*, Snarry, who referred to his memorandum-book, and appealed to his memory, as it reflected over the past forty years, gave me a satisfactory account of her high breeding, and then added, "If, when you go into the house, you ask Sir Tatton, he will tell you a good deal about her, farther back than I can go." Accordingly I did ask, and Sir Tatton entered into details with a clearness that those only who have had proof of his memory and knowledge can appreciate. Beginning where Snarry left off, Sir Tatton spoke of a certain mare in the line, who, he said, was out of the famous Jenny Horner, the best "cocktail" of her day in England. The time of Jenny Horner's performances was not stated, but must have been about the beginning of the century, and when such frauds were common as that of changing foals, by the substitution of thorough-bred for those of half-bred mares. It was when the practice was rife, which led to robberies which came to a crisis in the time of a horse called Tom Pane, with *aliases*. Thus it seems that, to go back to the half-bred stock which has left the imaginary stain on the Lawyer, we must retrace the genealogy over half a century, and pass over Jenny Horner, a mare held by Sir Tatton Sykes in about as much esteem as old Beeswing is by Yorkshiremen of the present time.—I am, Sir, &c.,

JOSEPH GAMGEE.

New Veterinary College, Edinburgh, 2d May 1865.

HALF-BRED HORSES AND THE STUD BOOK.

To the Editor of the Sporting Gazette.

DEAR SIR,—The enclosed note has been addressed to me by Mr Hutchinson, of the Manor House, Catterick. As it is an instructive account of a mare referred to by myself in a recent letter published in the *Sporting Gazette*, it will no doubt be acceptable to your readers.—Yours, &c., JOSEPH GAMGEE.

Edinburgh, 16th May 1865.

SIR,—As hunters' stakes are now becoming very fashionable, it is requisite to get horses as near pure bred as possible, to become successful with them, and still be able to trace back to the half-bred stock. We will instance the Lawyer. It appears the late Sir T. Sykes gave you his pedigree down to a mare called Jenny Horner. It so happens, from the mare being bred near here, that I have easily ascertained her pedigree from a Mr R. Hodgson, a nephew of Mr Shipley's, who bred her. She was got by Golumpus, the sire of old Catton, out of a mare called Applause by Syphon. Applause had only two crosses of blood; she won the Broomfield stakes, and two or three fifties. Mr Shipley sold her to Mr Lambton for 350 guineas; and in his possession, at seven years old, she won the Lambton Park Hunters' Stakes, I believe, ridden by the late Sir Tatton Sykes. She was then put to the stud, and served by a horse of Mr Lambton's called Leopold. By this horse she produced two fillies. They were very fast for a mile, but, unlike their dam, could not stay a distance. After that she was sold to go to France, where she ended her days. This may be useful to your friend for whom you bought the two mares; at all events, it will amuse you if you take an interest in such matters, as I do myself.—I remain, yours, &c.,

JOHN HUTCHINSON.

P.S.—I have traced the Peggy Taft family down to an Exmoor pony, served by Herod, nearly 100 years ago. Jenny Horner would be running about forty-five years ago. Mr Lambton, who bought her, afterwards became Lord Durham, of Lambton Castle, county of Durham.

Manor House, Catterick, Yorkshire,
May 16, 1865.

POULTRY-HOUSES.

WHAT is the best sort of poultry-house? This question will be answered variously by different individuals. As hinted in our remarks on some palpable blunders in the treatment of poultry, some are satisfied with bestowing the very smallest amount of attention on the hen-house. Any odd corner, let it be ever so dilapidated, open, and *from its space* and structure unfit as a lodging for fowls, is too often assigned for the

purpose. The people who act thus are generally among the grumblers at the slender revenue from their fowls. You must patiently hear them value the expenditure on their stock at some such figure as will make the cost of each egg twopence or threepence, while the poor hens, as innocent as they are truly unfortunate, get all the blame. Of course, the old-fashioned barn-door fowls or cottager's hens, hardened, but likewise stinted, by the severe training of their chickenhood, may be comparatively much less hurt by sleeping in a hovel than the different varieties of more generous descent. Still, as the smaller classes of cattle and sheep are now much improved, even on their native uplands, by closer attention and more genial treatment than formerly, all sorts of poultry are much the better for comfortable roosts in roomy, well-roofed houses. Perhaps nothing is worse than a leaky roof and a penetrating draught. Indeed, a duck's fondness for water is fully equalled by a hen's aversion to it. As for draughts, geese and ducks are the only poultry little affected by them, while other classes pay the penalty of exposure to them in much the same way as man himself, by suffering from sore throats, weak eyes, swollen head, and general debility. This state of things is particularly true of such stocks as are confined within too limited runs during the day, and are too crowded on their roosts at night. Yet there must be abundant fresh air admitted. If the walls of the house be of stone or bricks, this can be done through openings in the roof formed by raising one or more tiles or slates high enough up to save the fowls from the direct current of colder air. If the house be of wood, and the roof of felt or other tarred cloth, the object will be best gained by slight crevices between the boards, or holes bored through the door, or by the door itself being a loose fit, always guarding against a cold current rushing through the heads of the fowls. In summer, when the atmosphere is not too damp, the slip admitting into the yards, when not placed opposite the door, may be left open at night, wholly or partially, as the temperature outside demands. In a house made of boards overlapping one another the roof may be made perfectly tight, and a plentiful supply of fresh air be obtained from the effect of the sun's rays on the side-boarding and door. Hence most experienced poultry-fanciers prefer wooden houses to all others; and certainly in warm weather they merit the preference awarded to them; while in winter any too open part can be stopped up with straw or hay, and if necessary the whole walls may be made weather-proof by a screen canvas placed over them. Ventilation is also a very easy matter when the houses are not confined by their vicinity to other larger erections, as may be seen in the middle of a park devoted chiefly to the poultry of its wealthy owner. In such a situation, where room abounds, small movable houses are decidedly the best.

All houses, of whatever material formed, should be high enough for a large-sized man to stand erect in them, except under the lowest part of the roof, where there is no occasion to enter unless in a stooping posture to gather the eggs. This implies that the roosting spars should be placed under the highest part of the roof, and the nest under the lowest part, as they should be. Where room is precious, the nests should be covered in above, thus dispensing with all other assistance to the birds when flying to the roosting spars or descending from them. The spars may be made of any soft wood from three to three-and-a-half inches wide, a little rounded on the upper side, and the sharp edges taken off. We do not find any necessity for retaining the bark, if the spar be made of sawn fir.

The height of the perch should not exceed three or four feet, and should never be very near the roof, otherwise the cocks' combs will run imminent risk of being frost-bitten by coming in contact with the roof. All poultry, for the sake of cleanliness, should have this spar or perch—Cochins not excepted, although theirs need not be more than two feet above the floor. Indeed, all lumpish poultry, including the strong-winged but tender-toed Dorking, should have low roosts; and when the more active breeds, as Game, Hamburghs, and Spanish, are allowed to mount five or six feet above the floor, the range of nests should be closed in above with a wide board to afford them a landing-place when they leave their perch. Earthen floors are the best, but to remove from the fowls all temptation to scrape them up, they should be beaten hard, well watered on the surface, and then smoothed down with a trowel.

Where the houses are numerous it will be a great advantage to have them planned so as to pass right through the entire range of them without interruption, for the purposes both of cleaning and feeding. In such cases, also, the movable tressle-shaped perches should be used.

In smaller establishments a sheltered situation is often looked for, and the house leans against some good wall. Here the perches may be fixed, and within one outer door, under lock and key, may be formed several separate apartments, entering from

the main passage running parallel with the supporting wall, each containing one cock and from four to six hens. Before this term we had a house answering this description, sixteen feet long by eight feet wide, including the main passage. The four inner apartments were fitted up with open spars to admit light from the door and windows, which latter should be in the sides of the house, as, if placed in the roof, there will be considerable inconvenience during a snow storm. To adapt the house to the ground, one run entered at the end, and, looking northwards, had a board fence opposite the gable of the house as a shelter from cold winds. The subdivisions were necessarily small, yet with good airy runs and abundant ventilation through this wooden fabric, a stock of from sixteen to twenty hens and four cocks have thriven and maintained an honourable position in the show yard. Removing to a new house, we find only a garden border seven-and-a-half feet wide, but of great length, whereon to erect the future dwelling for our pets. Well, what is to be done? Why, against a wall six feet high we are placing a house, entering from the garden-walk, the passage inside being at right angles to the wall, the ridge of the roof being exactly in the middle of this passage overhead, and two inner doors enter a separate apartment on either side. The door of each is in the middle, as being most convenient for cleaning, and in this case, to avoid contact with the outer door, which, in its turn, yielding to the principle of convenience, opens inwards. Runs of the same width as the house communicate with both apartments, having each a door from the garden walk close at the corner of the house, and the trap-door or slip for the fowls is at the same corner. One perch in each, three feet high, runs from end to end of each division, and two roofed-in nests are placed over against the door and the middle of the perch. A large pane of glass is placed in the side of each division for light. Except the garden wall gable the whole is of overlapping boards. The roof does not overlap, as it is covered with tarpaulin. The inmates are to number twelve hens and two cocks; and if further subdivision be rendered necessary, the house is so halved that it can, with almost no change, have three apartments, or even four at a push.—*From the Scottish Farmer.*

ON MAKING OF DUTCH CHEESE.

WILL Scottish farmers ever make good cheese? We have our doubts whether in our day we shall see the accomplishment of so desirable an achievement, so very slow are they in improving the process of cheese-making, Ayrshire and Wigtownshire farmers excepted. And yet, most people allow that a good cheese is a good thing; and our analytical chemists assure us that even cheap cheese is very rich in elements of nutrition. Dr Lyon Playfair, in certain recently-published papers on the nature and composition of food, gives a table of the composition of food. Upon this he remarks: "Going down the nutritious table, we come to the leguminous plants, such as peas, beans, and lentils. *With the exception of cheap cheese*, this class of plants presents us with the most flesh-forming food in the whole table." But while cheese gives us cheap flesh, it sparingly supplies heat-giving material. This, however, is economically furnished in bread—"bread and cheese"—that proverbially simple fare which enables many a labourer to do a hard day's work with no addition save, it may be, a little skim milk. We have often wondered at the exploit. Dr Playfair presents us with the *rationale.*

It is the province of the farmer to furnish all the component parts of this nutritious meat. So far as the cheese is concerned, he does not in Scotland do well, or adequately, that which is required of him. The Scotch are not such a cheese-eating people as the English—possibly because the cheese made in Scotland is in general of inferior quality. The quantity, moreover, is so deficient, that the importation of cheese from abroad is very great, to the huge detriment, of course, of the Scottish agriculturist. Recent events must induce him to devote more attention to the rearing of oxen and the growth of forage of various kinds; and the same necessity must compel him to be more attentive to the produce of his dairy, in which, we are persuaded, he will find what will go far to compensate the diminished value of his corn crops.

But dairy husbandry, to be successfully prosecuted, demands attention to improving the breed of cows, and to the increased growth of forage plants, and, above all, intelligent acquaintance with the best modes of dairy management. Writing near a country-house where the market price of cheese does not exceed an average of 3d. per lb., we are surely justified in craving something better.

Will it pay? We shall answer that pertinent question by translating a letter on cheese-making by a distinguished Frenchman.*

When our Scottish farmers read of the enormous sum annually expended by France in importing cheese from Holland, let them remember that, substituting Great Britain for France, the same folly is chargeable on us. In 1862 we imported 703,909 cwts. cheese, of the computed real value of £1,550,094, and in the same year 1,037,371 cwts. butter, of the computed real value of £4,923,100. If, fired with the ambition of provisioning the marines with Dutch cheese, the British farmers resolve on making it like the long-keeping cheese of *Edam*, there is nothing to hinder him. The process is simply this: the milk is generally curdled by means of muriatic acid, or spirits of salt, and great care is taken to extract the whole of the whey, and to prevent fermentation. The curd is repeatedly broken and pressed, and before being made up in the round shape in which it is usually sold, the broken curd is well soaked in a strong solution of common salt in water, which effectually represses fermentation, and so ensures that the cheese shall keep long, even in warm climates. When the cheeses are finally pressed, all the remaining whey is washed out with the brine, they are rubbed with the salt over the outside, and set aside on shelves to dry in a cool place.

If a Scotchman cannot do this as well as a Dutchman, let him not pretend to be a farmer. But it is time to let M. Richard describe the daily operations at Cantal.

In summer, many dairies cover the mountains of Auvergne, whose substantial and invigorating plants afford excellent pasture; the milk of these dairies has, time immemorial, been applied to the making of a large cheese of mediocre quality, known by the name of *feurme* or Cantal cheese. It is generally supposed that the mountains of Upper Auvergne maintain from eighty to a hundred thousand cows of the Aubrac or the Salers breed. In the dairies which they form, from three to four millions kilogrammes of cheese are made, worth at the most eighty centimes the kilogramme; so that cheese-making at Cantal produces about three millions francs. In the actual state of the manufacture, the price of eighty centimes the kilogramme is relatively lower than that of other cheeses less esteemed. This, on the one hand, is owing to the limited sale, which is nearly confined to the south of France; and, on the other, it cannot be kept longer than six to eight months. After that time it is rancid, even rotten, and must be disposed of at any price, if one does not wish to lose it entirely. This explains the variations in the price, which from fifty francs the fifty kilogrammes, suddenly falls to twenty-five sometimes, and even lower; besides, the quality of this cheese hardly permits sending it to a distance, especially if the temperature be high.

For long the Administration and some proprietors have endeavoured to improve the making of Cantal cheese. Since 1731 the Government has tried to introduce the mode of making hard Dutch cheese suitable for victualling the marine. The Administration took the lead in these experiments, and offered assistance of every kind to those willing to engage in them; but at this time success was impeded by lack of the indispensable element of enlightenment, without which all progress becomes difficult, if not impossible.

This postponement or negation of progress recalls two important facts in the intervention of science to stimulate the advancement of our agriculture. The same causes which had deprived France of the potato and the merino hindered the improvement of cheese-making in the mountains of Cantal. The administration of Agriculture was pleased, in 1855, to resume the experiments which had previously failed. More fortunate this time, it had at its disposal pupils from the schools of agriculture able to study the question in a reasonable method, and to resolve it advantageously.

The Administration established an experimental dairy at St Angeau. It sent M. Le Senechal, director of this dairy, to Holland, in order to study the manufacture of the cheese, which, up to this time, could never be obtained in Auvergne. M. Le Senechal, on his return to St Angeau, after careful study on the spot of the Dutch method, introduced it into Auvergne, and succeeded. He made hard Dutch cheese, known under the name of *Edam cheese*. This production was sold at Marseilles, for the service of the marine, at the price of 160 fr. to 180 fr. the 100 kilogrammes. It exactly resembles that of the Dutch, specially employed in victual-

* Lettre Addressée A. M. Drouyn de Lhuys, President de la Société Impériale d'Acclimatation, par M. Richard (du Cantal,) Vice-Président de la Société.

ling the marine, and exported to all parts of the globe frequented by French ships. The great towns in France, particularly its seaports, are supplied with this Dutch cheese, because it keeps as long as is requisite, and is besides of good quality.

Notwithstanding the incontestable success of M. Le Senechal during six or seven years, nobody followed his example; so powerful is routine in opposing progress when the light does not paralyse its blind obstinacy.

The Central Society of Agriculture at Cantal appointed a commission to examine M. Le Senechal's process and make known its advantages. The writer went to St Angeau in order to study the question. The experiments of the Society of Agriculture were decidedly in favour of the new process, and those which he made at Seuliard have succeeded so well that, since June 1862, he has been making Dutch cheese which he sells at Marseilles for the marine at the price of 160 fr. the 100 kilogrammes, and for this purpose it has been found a very good quality.

If this manufacture were general in France, it will free her of the annual tribute which she pays to Holland, not only for provisioning the merchant and military navy, but also several of the large towns. France has not enough of cheese for victualling the marine. It annually applies to Holland to make up the deficiency. In three years, 1859 to 1861, France bought hard Dutch cheese, 10,668,444 kilogrammes, which at a minimum of 160 fr. the 100 kilogrammes, represent a sum of 17,069,510 fr. France can largely supply itself without paying such a sum to the foreigner. The Department of Cantal alone, if sufficiently enlightened to produce it, might annually make almost the quantity of cheese purchased in Holland. All the districts of France which make rich soft cheese—a product which does not keep, and the price of which is less when the sale is not quick—will, it is thought, willingly make Dutch *Edam* cheese when finding it profitable.

The writer wished to know the opinion of the metropolitan trade as to the nature of his cheeses. In Paris, those of Holland are appreciated, their present price according to the prices current, being from 160 francs the 100 kilogrammes. The writer went to Paris last February, taking with him twenty cheeses.

He was assured as to the good quality of the cheese made at Seuliard by the following incident:—"At Paris I put myself into correspondence with M. Lonchampt, a wholesale cheese merchant. After meeting him he wished to taste my productions. The day after my visit I sent him one. At the moment of receiving it a Dutch cheese merchant was with him. This merchant would not believe that the production was French, and, after well examining it, maintained that it came from Holland. It was pierced, carefully tasted, and the conclusion of this Dutch merchant was, that if in France cheese could be made of such quality, we had no need to go to his low country to buy it. These very words were reported to me by M. Lonchampt himself. He wished to have immediately one hundred of my cheeses. I had about one hundred and fifty to dispose of and I caused them to be despatched to him. I have learned from this merchant that his customers were very much pleased with them."

The question as to making hard Dutch cheese, capable of keeping long, and suitable for provisioning the marine, has, in M. Richard's opinion, been undeniably settled at Seuliard. The experiment succeeded at the very first. From that time he has not experienced the slightest disappointment; all his productions are good, in the opinion of the trade, and he always goes on with unvarying success.—*From the Scottish Farmer.*

EXTRAORDINARY CRUELTY TO SHEEP.

At the Petty Sessions for the division of Tiverton, held at the Town Hall the other day, Mr William Stoate of Alleford, Somerset, was charged by the Secretary of the Royal Society for the Prevention of Cruelty to Animals, with ill treating and torturing certain sheep on his farm, the Upcotts, Clayhanger, Devon. The court was crowded to excess, and the most intense excitement prevailed in the neighbourhood, owing to the notoriety of the alleged offence, the number of animals said to have been tortured, and the position of the defendant in the county. It appeared from the evidence of several witnesses that the defendant was an eccentric and wealthy barrister, and that at Midsummer last he sent a flock of 275 sheep, 13 bullocks, and 5 horses to the above named farm. In the course of the autumn some of the bullocks and horses were taken away, and as the winter advanced, and the food became scant,

the shepherd who had charge of the animals wrote to Mr Stoate, requesting him to provide food, as the sheep were starving," but he received only a supply of straw. The shepherd repeated several times his application without better success, and he was ultimately discharged by Mr Stoate in February last. Another shepherd was engaged for a fortnight, but since that date the sheep had been altogether uncared for, and about 130 of such animals and an Exmoor pony had literally died of starvation. One of the sheep had its eye picked out by a bird before it was dead, as it lay in a prostrate condition. The defendant pleaded that he had been buying straw through the winter to sustain the sheep, and that the present proceedings had been instituted from spite and malice, because there were many farmers in the neighbourhood who coveted his farm, and he would not let it to them. He conducted his own case, and his behaviour was very eccentric throughout the proceedings. The Bench, after a brief deliberation, sentenced the defendant to six weeks' imprisonment, with costs.

OBITUARY.

The death of Mr Richard Vines happened at his residence in College Street, Camden Town, London, on the 6th of April last.

In perusing this record, our readers, the more advanced in age amongst the members of the profession, will deplore the loss of one who, in the session 1823-4, was foremost amongst those who were students at that time, as a worker on the Anatomy of the Horse. Those who were his seniors will remember his early communications on various interesting subjects of physiological research; while every member, whose London veterinary diploma bears date subsequent to that time, and during the next fourteen years, will respect the memory of the deceased, as that of their first and ablest anatomical teacher.

After obtaining his diploma, early in the year of 1824, Mr Vines was appointed, by Professor Coleman, to the post of anatomical demonstrator; this being the first help of the kind which the pupils of that school had ever enjoyed. Vines's election was effected entirely by force of the students' spontaneous voices; since, in fact, the subject of this memoir had not only worked systematically during the previous years, at the anatomy of the horse, but attended the courses of those distinguished anatomists, Mr Joshua Brookes and Mr Charles Bell. Vines so far excelled that he was requested, during his second session, to give private demonstrations to a section of the college veterinary students; and such was his success, that his installation as the future demonstrator was established, leaving the Professor little more to do than to acknowledge the *de facto* election, on merit, by giving official sanction and a stipend.

It was announced the other day, at a meeting of the Council of the Royal College of Veterinary Surgeons, that Mr Vines "was for fourteen years demonstrator at the Royal Veterinary College at London." A touching reminder of old times and a warning are embodied in the above sentence.

For the man, who we unhesitatingly affirm to have been at the time the most efficient anatomical teacher of any veterinary surgeon in the kingdom, to have never been able to rise beyond the grade of demonstrator, shows that a rotten system, fraught with illiberality and injustice, was still dominant.

All who were acquainted with Vines at the early part of his professional career, and who knew his warmth of temperament, will have no difficulty in reconciling his exclusion from any step of promotion during fourteen years, with the beginning of antagonistic sentiments between the neglected man, who felt the pressure from which he could not get relief, and those with whom he acted; and which antagonism ripened into open rupture, and the forced resignation of one who had rendered good public service during his best years.

It would be a culpable withholding of the truth, if we omitted to state that, out of position, Vines's future life was deprived of all the real incentives to labour, which, when duly acknowledged and rewarded, becomes the greatest source of happiness, through its many influences that the world affords.

We always regarded our late fellow-worker ill-advised, in persisting to continue to reside in such close proximity, as he did, to the college—once his school, and the centre of his sanguine hopes; and afterwards the battle-ground on which he was baffled and vanquished. The place was out of the way of business, and in the centre of reminiscences of past disputes.

Vines, though he entered the profession somewhat later than could have been wished, about thirty years of age, and, like the majority of his contemporaries, had not enjoyed a good education, such as fully to train the faculties to that order and exactitude, which so much avail the scientific teacher, yet, from being a devoted worker, and a lover of his calling, he became both a good practical and philosophical teacher of the anatomy of the horse.

When, in the future, these questions become reviewed, it will probably appear that, during a series of years, when the teaching on the fundamental branches of veterinary science was in a most neglected state, the only individual to redeem the character of the school, was the demonstrator, Richard Vines.

Many members of the profession will hear with extreme regret of the death of our late esteemed friend, Mr WILLIAM M'KENNA of Belfast. The family of Mr M'Kenna had been gladdened, on Wednesday the 26th April, by the news that his eldest son, Mr James M'Kenna, had that morning successfully passed the examination for the diploma of the Royal College of Veterinary Surgeons, but the same evening they were called on to mourn an accident, which terminated fatally to Mr M'Kenna, senior, on the following Monday. The accident happened to Mr M'Kenna, while conversing with a gentleman, at the residence of the latter, in the immediate vicinity of Belfast. His horse, a young and spirited animal, suddenly reared up and fell on his master, who sustained severe internal bruises. For some days he rallied considerably, and hopes were entertained of his ultimate recovery, but these were doomed to be disappointed, and he sunk on the 1st May, from active pulmonary congestion.

The general esteem in which the late Mr M'Kenna was held may be judged of from the terms in which his death is mentioned by the local newspapers. We quote the following from the *Banner of Ulster*, of May 2d :—

"It is with sincere regret (a feeling that will be universally participated in) that we announce the death of Mr M'Kenna, veterinary surgeon. On Wednesday evening last, Mr M'Kenna received a serious injury by a fall from his horse. He continued in a precarious state till last night at half-past nine, when he died at the age of fifty-eight. Mr M'Kenna spent his whole life in his native town, and was one of our most respected citizens. At an early age he rose to eminence in his profession, and lived to be regarded as one of the most skilled and successful practitioners in Ireland. His sudden removal will be heard of with universal regret. He was distinguished during his whole career for integrity in all his dealings as a citizen, and warm-heartedness as a friend."

His diploma is dated 6th January 1835.

During the past month we have received a notice of the death of Mr GEORGE KIRKHAM, veterinary surgeon at West Derby, which took place on the 7th of May, in the 48th year of his age. His diploma dates 1843.

Also, after a lingering illness, Mr EDWARD BRADY, of London, a member of the Council and Treasurer of the Royal College of Veterinary Surgeons. His diploma is dated August 6, 1833.

ERRATA.

In May Number, page 241, lines 37 and 38, for "*hook*" read "*hock*." In several other places, for "*breach*" read "*breech*." In page 243, line 1, for "*fore*" read "*four*."

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THE VETERINARY REVIEW

AND

Stockowners' Journal.

ORIGINAL COMMUNICATIONS AND CASES.

Calculi in the Intestines of a Miller's Horse. By Professor MURRAY, M.R.C.V.S., Royal Agricultural College, Cirencester.

THE following case belongs to a class of not very common occurrence, and as some of the symptoms noticed have not been described by previous writers, I shall specially refer to them as possessing special interest and importance.

The patient was an aged bay horse belonging to Mr Allen, a miller near Cirencester. He was observed to be ill in the forenoon, and in consequence a colic draught was administered; his illness subsided to some extent, and they accordingly continued to work him, but symptoms of illness again appearing, he was yoked to a cart to draw a load into Cirencester, and after he had accomplished this task, he was to have the benefit of medical advice. I saw the horse about six in the evening, he was then very tympanitic, had a very dejected appearance, pulse small and rapid, breathing accelerated, and seemed suffering pain. I administered of the sp. ammon. aromat. ℥ i, and this was afterwards succeeded by the administration of a ball containing seven drachms of aloes, but the pain and other symptoms continued unabated. Injections of tepid water were administered five or six times with Gamgee's enema funnel; and, by watching the effect produced, I was led to conclude that the horse had an intestinal obstruction. Every one who has used this instrument must have noticed that bubbles of gas pass up through the fluid contained in the enema funnel before it all has entered the intestines. When the fluid is expelled, fœcal matter and flatus are simultaneously ejected. In this case, however, this was not the case; no bubbles of gas escaped through the fluid in the funnel; the horse strained so much, that very little fluid entered his intestines, and that which did enter, when ejected, was unaccompanied by either fœces or flatus. From these observa-

tions, I am justified in concluding that the enema funnel places us in a very favourable position for diagnosing intestinal obstruction, an advantage which we do not possess when using the ordinary injection syringe. The horse received a dose of anodyne medicine, as the persistent suffering which he endured made him alternately lie down and get up, and sometimes extend himself on his side, but nothing could relieve him, and it was evident that the very tympanitic state of his stomach and intestines formed a serious hindrance to the proper expansion of the lungs. His breathing was rapid, and characterised by a sighing sort of sound; a cold, clammy sweat broke out on the neck and face, and death then ensued in about a quarter of an hour. The horse died at eleven o'clock, about five hours after he had been subjected to treatment.

I made a *post-mortem* examination next day, and, though I had but little time to spare, I found that the stomach was filled with bran, the intestines were distended with gas, and the spleen was enlarged to about twice its normal size. What attracted my observation, however, immediately, was the empty state of the rectum, and the gut was empty until about two feet from the terminal part of the floating colon, in which a triangular shaped calculus was firmly impacted, so as completely to obstruct the passage of either fluid or solid materials. This calculus had evidently been firmly grasped by the muscular coat of the intestines. As it could not well be moved from its situation by pushing, I cut through the portion of intestine which surrounded it; the portion of intestine in contact with the calculus had a dark purplish colour. I then separated the mucous, muscular, and peritoneal coats from each other. The mucous coat was covered with purplish patches, but the whole of the muscular coat presented a purple colour; the peritoneal coat was not discoloured.

It is interesting, in a physiological point of view, to notice that the impaction of the calculus produced such nervous excitement as completely to arrest gastric digestion, and that it also caused an immense quantity of gas to be generated, and thus distended the intestines so much as ultimately to cause death. It is also interesting to notice that the discolouration was limited to the portion of intestine in contact with the calculus. There were no signs of inflammation, as the discolouration must be regarded as a physical rather than a vital effect. The absence of what I may term ordinary symptoms indicates intestinal obstruction; this part of the subject, however, has been referred to in speaking of the enema funnel.

Another calculus, also of a pyramidal form, was situated about two feet in front of the other one. The one which caused the obstruction weighed three pounds, one ounce, and the other one weighed two pounds, six ounces, and a-half.

Veterinary Records.—Poisoning of Pigs by Antimony.

By G. ARMATAGE, M.R.C.V.S.

ANTIMONY in the form of native sulphuret is used largely in empyrical practice, in the treatment of the diseases of the lower animals, forming the miraculous alterative powders of almost every groom. When mixed with other agents, as sulphur and nitre, and uncombined in most instances, it forms the sheet anchor of the pig keeper. No matter whether the pig has a "bit of cold," "off his meat," "getting too fat," "not getting fat enough," or what the ailment is, antimony is the remedy; and after a glance at the numerous uses to which this agent is so persistently applied, and the doses in which it is given, one feels surprised that, under such an indiscriminate system, the losses are not infinitely much greater.

Many deaths have, however, occurred which, I have had no doubt, were occasioned by this kind of treatment; but the owners have not thought it worth the trouble to search for the truth of the matter. In the case under consideration, doubtless, a similar state of things would have resulted, but for a feud which existed between the owner and his neighbour rendering it a matter of necessity that an investigation should be made, in order to clear up the doubts and suspicions of foul play which were entertained by the former. Otherwise, the death of the animals would have been looked upon as a circumstance of ordinary character only.

The owner of two pigs, who, by a process of quibbling, was in illegal possession of some land, charged a second individual (the rightful owuer) with causing their death, assigning that, as he was endeavouring to recover possession, poison had been maliciously thrown by him to the animals as they roamed over the ground. The latter person resented the foul charge, and to clear himself of the imputation, called in Mr Dudgeon, M.R.C.V.S., Sunderland, to make a *post-mortem* examination, on the 15th of April last. The carcasses were taken up from a hole in which they had been buried a few days, and carefully examined. The stomach, in both cases, was gorged with food, the mucous membrane of which gave unmistakable indications of intense inflammation having been going on, the process extending to the whole of the small intestines. The large intestines were free, and also the viscera of the chest.

Of their previous history, all that could be learned was, that on the Tuesday evening previous, their usual food had been supplied, and on the following morning the animals were found exhibiting all the indications of severe abdominal pain, with powerful but unsuccessful efforts to vomit.

No purgation was observed. The poor creatures continued in this condition for some time, one dying at 11 P.M., and the other about two o'clock on the following morning.

They were reported to be in perfect health, prior to Tuesday evening, and the owner stoutly denies having administered any medi-

cine whatever, the length of time which elapsed between their death and the *post-mortem* examination admitting of a removal of all supplies from the pig troughs, &c., baffling inquiries in that particular.

The accused person denied all knowledge of the affair, he protested his innocence, and utter absence of all motive and design on his part; and requested Mr Dudgeon to get the stomach and contents examined, in order to prove the existence or non-existence of any poison. Having had the particulars of the unfortunate occurrence detailed to me, and, on seeing the organs, expressed my conviction that some mineral poison had caused death, an opinion which was fully shared also by my friend Mr C. Hunting, M.R.C.V.S., who examined them on the same day, the stomachs, with their ingesta and small intestines, were handed over to me on the 17th by Mr Dudgeon, with a request that I should make an analysis, in order to confirm the suspicions which existed.

A portion of the ingesta, which were rolled up into a large mass, consisting of barley meal, with potato peelings, &c., was first taken and mixed with cold distilled water, broken down, allowed to stand for some time, and afterwards decanted; when a large quantity of a black glistening powder was discovered at the bottom of the flask, which, when carefully dried, had all the characteristics of rather coarsely powdered sulphuret of antimony, the larger grains of which were needle-shaped, with shining facets.

A small portion heated in a narrow test-tube gave rise to white fumes, and coated the sides with an orange-coloured deposit; the greater portion, however, was unaltered.

Another portion was boiled in dilute hydrochloric and tartaric acids, and a stream of sulphuretted hydrogen gas driven through it, when a copious yellow precipitate was thrown down. This was washed and filtered and divided into two portions. This precipitate was considerably paler than the natural sulphide of antimony, owing to the presence of organic matters being mixed with the powder. It, however, gradually grew darker, and within a few hours was perfectly characteristic, exhibiting the orange colour of the sulphide.

1st Portion.—Hydrochloric acid added gave off the sulphide of hydrogen, and dissolved the precipitate, the solution divided into two portions, *a*, *b*.

a. Distilled water added drop by drop gave a white precipitate.

b. A stream of sulphide of hydrogen reproduced the orange precipitate.

2nd Portion.—Also dissolved in hot hydrochloric acid, to which was added water till the solution ceased to give a white precipitate. This was collected, washed, filtered, and dried, and afterwards boiled with bitartrate of potass. The resulting solution of emetic tartar was divided into two portions, *a* and *b*.

a. Distilled water was added to this portion, to render it very *dilute, to which* was added a few drops of the per-chloride of iron,

when a copious yellow precipitate fell, the basic chlorides of antimony and iron.

b. A concentrated solution gave with the same agent a yellow colour only.

Separate portions of the stomach and small intestines, with their ingesta, were also submitted to processes of a similar character, in order to reduce from them the metallic poison, when the results from the tests applied were equally as decisive. In addition, Marsh's test by nascent hydrogen was employed, the black stains produced upon the porcelain being soluble in a solution of sulphide of ammonium, but unaltered by a solution of chloride of lime.

In the first instance, I dissolved about half a drachm of the black powder collected from the ingesta in hot hydrochloric acid, forming a reddish brown solution, which was divided into separate portions. To the first, caustic potass was added, which gave a white precipitate; and to the second, ammonia: this threw down an orange brown precipitate, which should have been white, but for the presence of iron, which, I believe, is frequently found associated with the sulphide of antimony, the red oxide of the former being mixed up with the precipitate.

In order to prove this more fully, the whole of the solution from which antimony had been separated by sulphide of hydrogen were then separately tested for iron; sulphide of ammonium giving a black precipitate, sulphide of hydrogen a yellow, ferrocyanide of potassium deep blue, ferridcyanide of potassium brown solution, sulphocyanide of potassium the peculiar and beautiful blood-red solution.

The quantity of the sulphide of antimony could not have been less than two or three ounces in each stomach, judging from the black colour of the ingesta and thick mucous which covered the lining membrane of the stomach, and I should think had been given with the food. This view appears reasonable, when the fact is considered that the contents of the small intestines collected, even at the extremity of the inflamed portions, gave distinct traces of antimony. The amount and quality of the food consumed also appears to have had some effect in delaying the action of the minerals, for the greater portion occupying the stomach was rolled into a mass, and contained the major portion of the poison. Had the stomach been supplied with sloppy food instead of meal, such a quantity of antimony could not have been taken in, from its specific gravity causing it to remain at the bottom of the pig trough; and, were it otherwise, the animals having taken the same quantity with their food, I am under the impression death would have ensued much sooner.

From all diligent inquiries instituted by Mr Dudgeon, nothing can be learned which favours the supposition that antimony was within reach of the pigs; and how they obtained it is a complete mystery. The owner avers he never administered to them medicines of any kind; and on the part of the accused it seems improbable that he would give, what he had no other cause to believe was but a mild

medicine, to effect the destruction of two pigs; nor would he have so readily sought the aid of Mr Dudgeon and courted an inquiry which might terminate sadly against his character and interests.

Rheumatism in a Cow and in a Gelding.

TO PROFESSOR GAMGEE.

MY DEAR SIR,—The observations made by you, and which appear in your Journal for this month, remind me of some cases which occurred in my practice, two of which, perhaps, you will permit me to make a few brief observations upon.

The first was that of a cow three years old, said to be in a bad state. This animal was visited by me—a distance of two miles or so from my own residence—and the following symptoms were present:—The first noticed was the strange expression of her eyes. She looked like an animal suffering from great excitement, almost amounting to madness; secondly, she was constipated in the bowels, partial suppression of urine, pulse accelerated, respiration hurried, but indicating this change from the usual course of things as being referable to a derangement of the digestive organs only. I have many times found *blindness* accompany affections of these organs, as well as those affections of the more vital part of the organism—the heart.

I proceeded to administer a cathartic, which in due course had the desired effect, when, on my visit made the day following, I found the patient suffering from what I considered *rheumatism* in the off fore leg. Hot-water dressings were applied to the limb, and in a few hours the lameness disappeared, but to attack the near hind limb. The succeeding day the near fore limb became affected, and in turn the off hind, until all had suffered. The treatment occupied about a week from the beginning to the end, when the animal was restored to health. This was a peculiar case to look at.

The second case was a black gelding, six years old; he had been driven a distance of twenty-four miles in one day, and in a day or two afterwards he was found stiff in both *front* legs. The animal was brought to the infirmary, and carefully examined by me. I could discover nothing to lead me to infer the disease was other than one of rheumatism. He was drenched with an alkaline solution of aloes, combined with a small portion of ammonia, and he became well in a day or two. Shortly after he was again attacked so as to be scarcely able to walk to the establishment. He was a second time placed under treatment and recovered in a few days, about a fortnight. He continued as long as I knew him to remain free from disease in the limbs,—viz., but a few months only, as he was sold. I have at all times been very sceptical in believing our patients suffer *so much* from diseases of this kind as some persons imagine. That they do *suffer* I make no doubt; but I am of opinion many of the so-called

attacks of rheumatism might have received other names, had the cases been properly understood. In my practice I have met with such cases,—viz., where they have been supposed to be of a rheumatic nature, merely from the fact that the examiners were not able to diagnose the disease.

I have always thought the term rheumatism a most *convenient* one, and well calculated to shield us from the hard hitting we may sometimes meet with when we are unable to show the precise spot—where lameness exists—to our employers. There are scores of instances when horses are lame from some cause or other, and that cause cannot be demonstrated to the *un*initiated, as there are not present those symptoms which will serve as our guide. To fully understand such cases, it is absolutely necessary we make ourselves acquainted with the *function* as well as the structure of parts, or, in other words, to thoroughly *understand action.* I have succeeded in diagnosing cases of occult lameness where some other practitioners have failed to do so, simply from the fact of turning especial attention to function of parts. I have several specimens in my possession which tend to prove my assertion.

The observations upon rheumatism made by Mr Owles and yourself are very interesting, and naturally lead one to reflection.—Believe me to remain faithfully yours, R. H. DYER.

P.S.—I am glad to inform you there is every prospect of being able to form a P. V. M. Association for these counties in the West of England as well as part of South Wales. Mr Bodington of Cardiff is very zealous in the cause; he is stirring up the brothers of our order in his district. I have no doubt we shall have a good meeting, as it is intended to assemble at Plymouth during the visit of the "*Royal.*" R. H. D.

TORQUAY, *June* 2, 1865.

Fractures of a Navicular Bone, following on protracted and a progressive diseased condition of the same, with altered condition of the Pedal Bone. By JOSEPH GAMGEE, Sen., Professor in the New Veterinary College.

To the Editor of the Edinburgh Veterinary Review.

ALDERSHOTT, 3*d June* 1865.

SIR,—The remarks in your journal for this month by Professor Gamgee, sen., on my letter of the 5th May, entitle me to expect the opportunity of replying to such of them as relate to the subject. I shall not occupy much of your space, as I do not intend to follow the professor from the point, although he appears determined not to adhere to it. I shall content myself with directing attention to the

extraordinary mode of reasoning he must have called to his aid when the professor discovered that the history of the case given in my last letter gives a new aspect to it. I am curious to know how he arrived at this new aspect from reading my letter, in which, after describing the horse as fresh, and showing no symptoms of being infirm, &c., up to June 1862, I stated in the 21st line,—"This horse was affected in June 1862 with *sudden* and permanent lameness, as previously stated;" mark this, *previously stated.* Notwithstanding this plain English, Professor Gamgee in his remarks states, "It now turns out that instead of the case being one of sudden transition from complete soundness to incurable lameness," &c. I ask, what does he mean? If *sudden* and *permanent* lameness in this case be not a sudden transition from complete soundness to incurable lameness, what is it? Have the words in my letter—*sudden* and *permanent*—no meaning to the professor. Again, acting under the influence of preconceived ideas, he persists in misunderstanding my previous letter, and claims diseased fetlocks as diseased feet, because, as he tells us now, "Fetlocks I regard as regions of the feet." Now, I have not the least objection to his so regarding them, provided he does not also regard navicular disease and rheumatic inflammation of the fetlocks as identical diseases in the case in question, and also endeavour to make it appear that where I write of diseased fetlocks, I am speaking of feet. This animal had rheumatism of the fetlocks, and navicular disease in *one* foot, at one and the same time, *i.e.*, in the autumn and winter of 1862. Professor Gamgee says, "In the account of the case referred to, I can see nothing to indicate the presence of rheumatism." The symptoms of rheumatism as a sequel to influenza are neither obscure, nor very unusual. I saw some four or five cases during the winter of 1862–63. The professor failing to credit my statement cannot affect its truth, or alter the fact that this horse had unmistakable rheumatism. His other remarks, being so wide of the question, need no comment. I will only add, that this horse had done no work for three months before he was killed, so, if the fractures occurred only a few days previously, as the professor states, work could not have been the cause of them.—I have the honour to be, sir, your obedient servant,

ALFRED J. OWLES,
Veterinary Surgeon, Gen. Staff.

ALDERSHOTT, *5th June* 1865.

SIR,—As a postscript to my letter of the 3d inst., replying to the charge Professor Gamgee, sen., makes upon me, of changing the aspect of the case which I sent to your journal for May, I will now send you one instance of the professor's self-contradiction, to show the incorrectness of his reasoning, and the value to be attached to his deductions. In his remarks on my first communication, the professor says, alluding to the rheumatism in the fetlocks, "I believe the swollen *state of the* pasterns was due to the fractured and complicated con-

dition of the bones and tissues below."—(See *Edinburgh Veterinary Review* for May.) And in his remarks on my second communication, he says, "The fractures occurred only a few days before death." The condition of the fetlocks, *i.e.*, rheumatism, existed in 1862, (as I have before stated,) and death took place in January 1865, more than two years subsequently; so, according to the professor's reasoning, the fractures of the navicular bone in 1865 produced the diseased condition of the fetlocks in 1862. It is upon such reasoning as this the professor scruples not to question my diagnosis. Surely such writing as this requires no comment; but as I am accused of changing the aspect of my case, you will do me the justice of publishing this, together with my letter, as I have a right to show the public, through the same journal, upon what premises Professor Gamgee arrives at his *remarkable* conclusions.—I have the honour to be, sir, your obedient servant,

ALFRED J. OWLES,
Veterinary Surgeon, Gen. Staff.

On the Modes in vogue of Awarding Prizes at Agricultural Associations to "Horse-Shoers." By JOSEPH GAMGEE, sen.

PASSIVE inactivity is not a desirable state to be in, either for societies or individuals; worse still, however, is misdirected meddling.

It is impossible to deny, with truth, the lamentably unsatisfactory state of the art of horse-shoeing throughout this kingdom; and it is discouraging to see, as is the fact, that for many years past the faults of commission have produced more positively injurious effects than those of omission had ever done, so far, at least, as the state of matters can be ascertained now.

Failing to devise a rational system of horse-shoeing, and neglecting to follow the methods pursued in other countries, the subject has been treated in England as quite an open question. Jack was as good as his master; amateurs and adventurers tried their hands; while confusion became more and more confounded. Within the last seven years, what have, by courtesy, been called "prizes to horse-shoers," have been set on foot in some localities; conspicuous, in particular, has been "The West of England Agricultural Society." And to show the position in which the horse-shoer is placed, and the exhibition made of the art of farriery, the following paragraph, taken from a London weekly sporting paper, is produced. The passage quoted is given, assumedly, on authority:—

"BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.—A novelty in Wednesday's proceedings (as the competitive sheep-shearing was on Monday) was the horse-shoeing at portable forges, and as it is unfortunately true that nine out of ten cases of foot lameness arise from bad shoeing, the Society has done well in thus attracting public interest to the question. When will the village smith understand that, instead of paring and rasping a horse's foot to fit a shoe, the iron shoe should be made to fit the foot, with an equable bearing all round from heel to heel, just as he likes a leather shoe to sustain and accommodate his own sole with ease and comfort! When will

he admit that an elastic hoof requires the placing of the nails so that the inner heel may expand under weight! The trial was conducted as follows:—The smiths drew lots for the number of the forge, the number of the horses, and the foot to be shod. Each man then made his shoe and the requisite number of nails, the time occupied being from twenty to thirty minutes; and after inspection by the judges the shoes were fitted and nailed on, the time occupied by each man being noted. The principal points of the performance consist of the time taken to construct the shoe, the level form of the shoe, the situation of the holes and what is called the fullering, the proper and even-seating of the shoe, the preparation of the foot, the fitting of the shoe, the nailing on, and the time occupied in each of the several operations."

The above shows, better than any words of mine can convey, the degraded state in which this important art is at the present time—an art second to few, if any, for the breadth of its application, equally important in its operation, and difficult of acquisition. The craft of farriery has all the attributes, if it were properly cultivated, of a science and an art; and yet here we have the disgusting spectacle of seeing the sheep-shearer and horse-shoer placed in the same category, exhibiting their physical powers, respectively, at clipping, nail-making, hammering, and paring; and if perchance there had been a prize for pork-butchers, then there would have been additionally—sticking.

In no other country in Europe could such a proclamation be found, in proof of a wide-spread ignorance on that important subject—horse-shoeing—lamentably illustrative of the state of matters.

Instead of a well-founded system for the instruction of farriers, here we have the patronising display of doling out some £10 between a number of men, coming from distant places, to perform certain acts according to prescribed procedure, dictated in the absence of rational guidance, and without practical rules on the subject; all has to be tested, not by manner, but by time. Poor horses! and oh! for the honour of veterinary medicine! Napoleon le Grand called the English a nation of shopkeepers. I don't know for why; but if an agricultural society of France were to treat the question of horse-shoeing in the way we see it carried out in England, with an evident catering for approval, their standard would soon be lowered.

These "prizes for horse-shoers" serve for a display, and to see a few poor men working and sweating, in the absence of anything to raise their minds to the real worth and the important nature of their calling. The trifle gained by the two or three most successful, after the exhilaration of the evening, may perchance suffice to buy the wife a gown, and the children a pair or two of shoes; while the poor man himself, left in ignorance, becomes puffed up as the best horse-shoer of his neighbourhood. So much for best; if they only knew the standard, the relative position would not be coveted.

Enough of alternately leading and driving of the English horse-shoer from one series of errors to another. Let these men be instructed, and they are as capable and as willing as other men of being taught to think; but, misguided as they have been, the men and their calling are lowered in the eyes of the world.

It would be a reasonable service if the men and their directors

were made to change places; no man can instruct another in a branch of knowledge he never learnt himself. When will Englishmen be led to understand that the feet are to horses what brains and hands together are to man—everything?

Statistics of Live Stock and Dead Meat for Consumption in the Metropolis. By ROBERT HERBERT.

(*From the Journal of the Royal Agricultural Society.*)

ALTHOUGH the Metropolitan Cattle Market was extensively supplied with most breeds of beasts during the last six months of 1864, there was a great deficiency in the weight of meat disposed of—indeed, fully half of the stock on offer was beneath the middle quality. The severe drought experienced during the summer months, and the consequent want of grass, and the serious deficiency in the turnip-crop over the whole of our grazing districts, compelled the graziers to purchase large additional quantities of linseed and cake, and had great influence upon prices. At one period really prime Scots and crosses produced as much as 6s. per 8 lbs.; and even the more general range in their value was 5s. 6d. and 5s. 8d. per 8 lbs. These high rates fully justified our anticipations. From the circumstance that beasts have fattened slowly during the last three or four months, and that the numbers in the stalls in our leading counties are very moderate for the time of year, it is evident that there is little or no prospect of any important decline in current rates between this and the close of the Norfolk "season." During the six months only 60,350 beasts arrived in the Metropolitan Market from Lincolnshire, Leicestershire, and Northamptonshire, against 66,510 head in 1863, and 74,570 in 1862. The deficiency in the arrivals from the above districts was not confined to numbers only, since fully one-third of them were only fit for second and third class consumption. From the eastern districts an increased number of beasts was reported; but the comparative excess in the supply arose solely from many of the graziers being compelled to dispose of a portion of their stock much earlier than usual. Other parts of England furnished a very middling show of stock, both as to number and quality. From Scotland, however, the arrivals were a full average, and in wonderfully fine condition; indeed, scarcely an inferior bullock arrived from that quarter. The drought in Scotland was much less severely felt than in England; the turnip and potato crops have turned out well, and of good quality; and stock generally has fattened quite as rapidly as in the most favoured seasons. Ireland furnished only 7079 beasts, against 11,280 in 1863, and 14,820 in 1862. As the Irish stock has shown no improvement, sales have progressed slowly, at moderate rates.

The annexed return shows the quarters from whence the sup-

plies of beasts were derived in the last six months of the last five years:—

DISTRICT BULLOCK ARRIVALS.

Last half of year.	Northern Districts.	Eastern Districts.	Other parts of England.	Scotland.	Ireland.
1860 . .	66,140	9500	20,500	1151	7,852
1861 . .	71,450	2500	9,700	4586	14,340
1862 . .	74,570	5050	19,620	3307	14,820
1863 . .	66,510	3850	21,250	3213	11,280
1864 . .	60,350	8400	19,400	3625	7,079

This is certainly a most unsatisfactory statement as a whole. The consumption in London is increasing every year; prices have continued to improve; and even the excessive importations from the Continent have failed to affect the value of English stock. The question, therefore, of an adequate supply of food has become a serious one, more especially as the foreign arrivals, with very few exceptions, are still very deficient in quality. The foreign sheep have shown very little improvement, although some few of them have sold as high as 78s. and even 80s. each. They still continue, however, to carry a quantity of internal fat. Foreign calves, which now form three-fourths of the supplies, have sold steadily; and fair prices have been made for pigs, although the importations exceeded all previous years. The arrivals into London were shipped from the undermentioned ports:—

IMPORTS OF FOREIGN STOCK INTO LONDON DURING THE LAST SIX MONTHS OF 1864.

From	Beasts.	Sheep.	Lambs.	Calves.	Pigs.
Amsterdam . .	372	1,473	2	61	—
Antwerp . . .	122	32	—	754	369
Boulogne . . .	152	15	—	175	4,675
Bremen . . .	5,386	1,890	172	1	—
Cadiz . . .	139	—	—	—	—
Calais . . .	—	—	60	88	1,433
Dordt . . .	2,990	15,467	3,333	51	18
Dunkirk . . .	127	—	—	157	2,579
Gibraltar . . .	605	—	—	—	—
Hamburg . . .	1,829	25,406	154	44	3,415
Harlingen . .	9,900	26,912	1,491	2,437	10,324
Havre . . .	1	—	—	—	—
Lyston . . .	20	—	—	—	—
Medemblik . .	2,393	30,628	1	228	4
Nieu Dieppe . .	249	2,140	—	258	8
Oporto . . .	392	—	—	—	—
Ostend . . .	632	503	31	515	575
Rotterdam . .	22,198	92,849	3,177	12,021	7,403
Tonning . . .	28,898	29,342	3,043	3	—
Vigo	587	—	—	—	—
Total . . .	76,992	226,657	11,464	16,793	30,803

Here we have a total supply from abroad of no less than 362,709 head, an increase of 23,630 head on 1863. It will be perceived that nearly 29,000 beasts were shipped from Tonning, but of this large number about 20,000 were only fit for grazing purposes. Rotterdam comes next in importance. The Dutch stock, however, was very inferior in quality to that imported in 1862 and 1863. The same remark may be applied to the arrivals from most other quarters; consequently, the addition to our supply of animal food was comparatively small. Rather a large business has been passing in foreign pigs. For the most part they have arrived in fair condition, but the prices realised for them have been very low, viz., from 3s. 8d. to 4s. 2d. per 8 lbs. The imports of foreign stock into the United Kingdom during the last six months of the undermentioned years were:—

IMPORTS INTO THE UNITED KINGDOM.

Last half of year.	Beasts.	Sheep and Lambs.	Calves.	Pigs.
1863 . .	61,435	241,209	17,497	18,936
1862 . .	57,356	250,140	19,610	17,279
1861 . .	59,049	266,249	19,715	25,919
1860 . .	59,817	243,804	19,594	21,510

The aggregate supplies of each kind of stock exhibited in the great Metropolitan Cattle Market in the last six months were:—

	Head.
Beasts	177,944
Cows	3,221
Sheep and lambs	769,814
Calves	17,967
Pigs	19,306

In the four previous seasons, ending with 1863, the show of stock was as follows:—

TOTAL SUPPLIES OF STOCK EXHIBITED.

Last half of year.	Beasts.	Cows.	Sheep and Lambs.	Calves.	Pigs.
1860 . .	145,420	3015	762,740	15,766	15,470
1861 . .	149,750	3187	774,260	12,441	20,116
1862 . .	159,450	3148	759,671	12,579	18,220
1863 . .	168,232	3127	761,070	14,822	17,550

The lowest average value of inferior beasts in 1864 was 3s. 6d.; of middling stock, 4s. 6d.; and prime, 5s. 6d. per 8 lbs. The heavy arrivals from the Continent prevented any rise of moment in the former quotation; but in the latter there was an advance of 6d. per 8 lbs. Sheep were the turn dearer. Lambs sold at from 5s. 6d. to 8s.; calves, 4s. to 5s. 10d.; and pigs, 3s. 6d. to 5s. per 8 lbs., to sink the offal. The following selection from the six months' averages will illustrate the recent rise in prices:—

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Havre . . .	1	—	—	—	—
Lyston . . .	20	—	—	—	—
Medemblik . .	2,393	30,628	1	228	4
Nieu Dieppe . .	249	2,140	—	258	8
Oporto . . .	392	—	—	—	—
Ostend . . .	632	503	31	515	575
Rotterdam . .	22,198	92,849	3,177	12,021	7,403
Tonning . . .	28,898	29,342	3,043	3	—
Vigo	587	—	—	—	—
Total . . .	76,992	226,657	11,464	16,793	30,803

Here we have a total supply from abroad of no less than 362,709 head, an increase of 23,630 head on 1863. It will be perceived that nearly 29,000 beasts were shipped from Tonning, but of this large number about 20,000 were only fit for grazing purposes. Rotterdam comes next in importance. The Dutch stock, however, was very inferior in quality to that imported in 1862 and 1863. The same remark may be applied to the arrivals from most other quarters; consequently, the addition to our supply of animal food was comparatively small. Rather a large business has been passing in foreign pigs. For the most part they have arrived in fair condition, but the prices realised for them have been very low, viz., from 3s. 8d. to 4s. 2d. per 8 lbs. The imports of foreign stock into the United Kingdom during the last six months of the undermentioned years were:—

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Last half of year.	Beasts.	Sheep and Lambs.	Calves.	Pigs.
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1862 . .	57,356	250,140	19,610	17,279
1861 . .	59,049	266,249	19,715	25,919
1860 . .	59,817	243,804	19,594	21,510

The aggregate supplies of each kind of stock exhibited in the great Metropolitan Cattle Market in the last six months were:—

	Head.
Beasts	177,944
Cows	3,221
Sheep and lambs	769,814
Calves	17,967
Pigs	19,306

In the four previous seasons, ending with 1863, the show of stock was as follows:—

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1862 . .	159,450	3148	759,671	12,579	18,220
1863 . .	168,232	3127	761,070	14,822	17,550

The lowest average value of inferior beasts in 1864 was 3s. 6d.; of middling stock, 4s. 6d.; and prime, 5s. 6d. per 8 lbs. The heavy arrivals from the Continent prevented any rise of moment in the former quotation; but in the latter there was an advance of 6d. per 8 lbs. Sheep were the turn dearer. Lambs sold at from 5s. 6d. to 8s.; calves, 4s. to 5s. 10d.; and pigs, 3s. 6d. to 5s. per 8 lbs., to sink the offal. The following selection from the six months' averages will illustrate the recent rise in prices:—

plies of beasts were derived in the last six months of the last five years:—

DISTRICT BULLOCK ARRIVALS.

Last half of year.	Northern Districts.	Eastern Districts.	Other parts of England.	Scotland.	Ireland.
1860 . .	66,140	9500	20,500	1151	7,852
1861 . .	71,450	2500	9,700	4586	14,340
1862 . .	74,570	5050	19,620	3307	14,820
1863 . .	66,510	3850	21,250	3213	11,280
1864 . .	60,350	8400	19,400	3625	7,079

This is certainly a most unsatisfactory statement as a whole. The consumption in London is increasing every year; prices have continued to improve; and even the excessive importations from the Continent have failed to affect the value of English stock. The question, therefore, of an adequate supply of food has become a serious one, more especially as the foreign arrivals, with very few exceptions, are still very deficient in quality. The foreign sheep have shown very little improvement, although some few of them have sold as high as 78s. and even 80s. each. They still continue, however, to carry a quantity of internal fat. Foreign calves, which now form three-fourths of the supplies, have sold steadily; and fair prices have been made for pigs, although the importations exceeded all previous years. The arrivals into London were shipped from the undermentioned ports:—

IMPORTS OF FOREIGN STOCK INTO LONDON DURING THE LAST SIX MONTHS OF 1864.

From	Beasts.	Sheep.	Lambs.	Calves.	Pigs.
Amsterdam . .	372	1,473	2	61	—
Antwerp . . .	122	32	—	754	369
Boulogne . . .	152	15	—	175	4,675
Bremen . . .	5,386	1,890	172	1	—
Cadiz . . .	139	—	—	—	—
Calais . . .	—	—	60	88	1,433
Dordt . . .	2,990	15,467	3,333	51	18
Dunkirk . . .	127	—	—	157	2,579
Gibraltar . . .	605	—	—	—	—
Hamburg . . .	1,829	25,406	154	44	3,415
Harlingen . .	9,900	26,912	1,491	2,437	10,324
Havre . . .	1	—	—	—	—
Lyston . . .	20	—	—	—	—
Medemblik . .	2,393	30,628	1	228	4
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AVERAGE PRICES OF BEEF AND MUTTON.

Per 8 lbs., to sink the offal.

BEEF.

	1860.	1861.	1862.	1863.	1864.
	s. d.	s. d.	s. d.	s. d.	s. d.
Inferior . . .	2 8	3 0	3 2	3 4	3 6
Middling . . .	4 0	4 0	4 0	4 2	4 6
Prime	5 4	5 0	4 10	5 0	5 6

MUTTON.

	1860.	1861.	1862.	1863.	1864.
	s. d.	s. d.	s. d.	s. d.	s. d.
Inferior . . .	3 2	3 2	3 8	4 0	4 2
Middling . . .	4 6	4 6	4 8	5 0	5 2
Prime	5 10	5 8	5 6	5 10	5 10

Although the supply of rough fat has been very moderate, the demand for it has been heavy at 2s. 1½d. and 2s. 2d. per 8 lbs. The great falling off in the exports of tallow from St Petersburg, as well as from Australia, the Cape, &c., has had very little influence upon the value of fat. That article has consequently ceased to be of much profit to the butchers.

Fair average supplies of meat have been on sale in Newgate and Leadenhall markets. Generally speaking the trade has ruled steady, at comparatively high rates. Beef has realised 2s. 10d. to 5s.; mutton, 3s. 6d. to 5s.; lamb, 5s. to 7s. 4d.; veal, 3s. 8d. to 5s. 4d.; pork, 3s. 4d. to 5s. per 8 lbs. by the carcase.

Letters from Holland and Germany state that unusually heavy shipments of stock will be made to England in 1865. The want of adequate supplies of food in both countries does not favour the impression entertained in some quarters, that the supplies will reach us in improved condition. It may, therefore, be safely assumed that we shall have high rates for both beasts and sheep for several months. The few shorn sheep disposed of in the metropolis have sold at 1s. 2d. per 8 lbs. below those in the wool. This wide difference must be attributed to the scarcity of wool in the country, notwithstanding that the arrivals from our colonies and foreign parts in 1864 were on a very extensive scale. The three years' importations were :—

	1862 Bales	1863 Bales	1864 Bales
Colonial . . .	345,605	375,010	430,395
Foreign . . .	222,063	220,316	240,512
Total . .	567,668	595,326	670,907

The exports to the Continent were only moderate, consequently *the bulk of the* importations passed into consumption in this coun-

try. It may be remarked, however, that, whilst foreign and colonial wools have receded in value, owing to the high rates prevalent in the discount market, English qualities have been on the advance, with more than usual activity in the demand. The quotations for home-grown wool in the metropolis at the close of the last two years were :—

	1863. Per lb.					1864. Per lb.				
	s.	d.		s.	d.	s.	d.		s.	d.
Fleeces :—										
South Down hoggetts	1	10½	to	1	11½	2	0	to	2	1½
Half-bred hoggetts	2	0	to	2	0½	2	5	to	2	6
Kent fleeces	1	11	to	1	11½	2	2	to	2	2½
South Down ewes and wethers	1	8	to	1	9	1	11	to	2	0
Leicester ditto	1	9½	to	1	10½	2	1	to	2	2
Sorts :—										
Clothing picklock	1	9½	to	1	10	2	0	to	2	0½
Prime and picklock	1	8½	to	1	9	1	10	to	1	10½
Choice	1	7	to	1	8	1	9	to	1	9½
Super	1	6	to	1	6½	1	6	to	1	6½
Combing :—										
Wether matching	1	11	to	1	11½	2	1½	to	2	2
Picklock	1	9	to	1	9½	2	0	to	2	0½
Common	1	5	to	1	6	1	8	to	1	10
Hog matching	2	0½	to	2	1½	2	2	to	2	3
Picklock matching	1	8½	to	1	9	2	0	to	2	2
Super ditto	1	5½	to	1	6½	1	8	to	1	10

The high prices still demanded for cotton are calculated to give considerable support to the value of wool, even though the present year's clip may turn out equal to that of last season.

On the Composition and Nutritive Value of Palm-Nut-Kernel Meal and Cake. By Dr AUGUSTUS VOELCKER.

(*From the Journal of the Royal Agricultural Society.*)

THIS, comparatively speaking, new feeding-material is the residue obtained on submitting to strong pressure the oleaginous kernels of the palm-nut. These kernels are encased in a thick brown shell of woody matter, and this is surrounded by a deep orange-coloured pulp, from which the palm-oil of commerce is produced by gentle pressure.

The bulk of palm-nut kernels, which is nearly white, is covered by a thin brownish layer of woody fibre, and in consequence of which palm-nut meal has a light brown or dirt-coloured appearance.

The size of these kernels varies from that of a hazel-nut to that of a small pigeon-egg; they are very hard, nearly inodorous, rather insipid to the taste, and very rich in fatty matters, possessing the consistency of butter, and the useful property of not readily turning rancid. The extraction of the fatty matters necessitates the reduction of the kernels into a tolerably fine powder, and the application of powerful crushing machinery and gentle heat. Notwithstanding these means, the cake or meal left in the presses contains usually a larger proportion of fat than is found in linseed, rape, and most other kinds of oil-cakes.

I first became acquainted with this meal in the spring of 1861, when a sample was sent to me for analysis by Messrs Alexander Smith & Co., Kent Street Oil-mills, Liverpool.

The analysis furnished the following results:—

Moisture	7·49
Fatty matters	26·57
*Albuminous compounds (flesh-forming matters)	15·75
Starch, mucilage, sugar and digestible fibre	37·89
Woody fibre (cellulose)	8·40
Mineral matters (ash)	3·90
	100·00
*Containing nitrogen	2·52

It appears from these results,—

1. That this meal was very rich in ready-made fat. In the best linseed-cake the percentage of oil rarely amounts to 12 per cent., and 10 per cent. may be taken as a fair average. The palm-kernel meal analysed by me thus contained more than twice as much fatty matter, and theoretically is much superior to oil-cake as a direct supplier of fat.

2. The proportion of flesh-forming (nitrogenous) matters is fully as large as in the best barley-meal, but much less than in linseed, rape, or cotton-cake; nor is it equal to that found in peas, lentils, and other leguminous seeds.

3. The amount of indigestible woody fibre is but small.

4. It contains about as much mineral matter as cereal grains, and thus is not particularly noted for bone-producing qualities.

From these remarks it may be gathered that palm-nut-kernel meal is not so well adapted for the rearing of young stock as for fattening animals, and that it surpasses almost all other articles of food in its theoretical value as a fat-producer. The proximate composition of articles of food unquestionably affords useful indications of their properties; but such indications are insufficient to determine with certainty the real nutritive value of food. Analysis may point out the existence of a large amount of oil or fat in a substance, but it does not decide whether these matters, as in the castor-oil beans or croton beans, possess medicinal properties, or whether, like linseed or rape-oil, they are available in the animal economy for the production of fat. On these and other points that readily suggest themselves to feeders of stock desirous of using a hitherto untried food, practical experience has to be appealed to for a final decision. Fully impressed with the propriety of submitting palm-nut meal to a sufficiently decisive experimental test before giving a definite opinion of its economical value, I procured a supply from Messrs Smith, which I placed in the hands of Mr Coleman, the late manager of the farm attached to the Royal Agricultural College, Cirencester. I expected in the course of three or four months to have reported on the result; however, more than a year elapsed before the feeding experiments could be said to have been fairly concluded.

Well-fed animals, liberally supplied with succulent, sweet roots, good linseed-cake, hay, and other palatable food, it is well known, do

not relish a change, if the substituted food happens to be less palatable than that to which they have been accustomed. Palm-nut meal is certainly not so nice to the taste as linseed-cake or swedes and hay; some difficulty consequently was experienced in inducing animals to eat it, and neither the cow-man nor the person in charge of the pigs possessed the requisite patience to give the meal a fair trial, and both declared it to be little better than sawdust. After repeated attempts to overcome the prejudice of the cow and pig-man, the meal was consigned to the granary, where it remained for nearly ten months. By that time the store of oil-cake was almost consumed, the supply of roots ran short, and the price of all feeding materials was very high. Under these circumstances an application for a fresh supply of oil-cake for the use of the sheep was not very favourably received by Mr Coleman, who gave the shepherd liberty to use the despised palm-nut meal. Probably somewhat stinted in food, the sheep took to the palm-meal at once, and after a few days ate it up greedily, and, what is more, throve upon it remarkably well. All who had seen the sheep before they had received palm-nut meal, and after they were fed upon it for only a short time, were unanimous in attaching a very high value to this meal. The shepherd, indeed, soon learned to prefer it to the best linseed-cake, and had the satisfaction of getting the first prize for fat sheep at the Gloucestershire Agricultural Society's Show.

The success in the sheep-feed paved the way to a more favourable reception of the palm-nut meal than it received on the outset from the part of our cow-man, who now found that 3 to 4 lbs. a day not only increased the quantity of milk, but likewise greatly enriched its quality. I need hardly say that, in consequence of this favourable experience, large quantities of palm-nut meal were subsequently consumed on the College-farm.

By degrees this meal found its way amongst agriculturists; and all who have given it a fair trial speak in the highest terms of its fat and milk-producing properties.

During the last year a good many samples were sent to me for examination from various parts of the country. The following table shows the composition of six samples of

PALM-NUT-KERNEL MEAL.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
Moisture . . .	7·49	6·91	6·69	7·52	7·02	7·21
Fatty matters . .	26·57	26·50	23·92	22·68	19·95	22·79
*Albuminous compounds (flesh-forming matters)	15·75	14·93	15·25	16·75	17·01	15·56
Mucilage, starch, sugar, and digestible fibre	37·89	31·20	40·62	32·14	33·76	36·24
Woody fibre (cellulose)	8·40	16·13	10·40	17·49	18·70	14·90
Mineral matters (ash) .	3 90	4·33	3·12	3.42	3·56	3·30
	100·00	100·00	100·00	100·00	100·00	100·00
*Containing nitrogen .	2·52	2·39	2·44	2.88	2.72	2.49

It will be seen that all six samples are very rich in fatty matter, which accounts for the marked effect which the meal has upon the production of a rich milk; moreover, the fatty matter has about the same consistency as butter, and hardly any smell, which probably explains why a good tasting and sufficiently hard butter is produced from the milk of cows fed upon it.

The two first-mentioned samples contained no less than 26½ per cent., and the other four from 20 to 24 per cent. of ready-made fat.

This is a very large percentage of the most valuable of all food-constituents in an economical point of view. If it be borne in mind that one part of ready-made fat or oil is equivalent to 2½ parts of starch, and that good wheat or barley seldom contains more than 60 to 65 per cent. of starch and analogous heat and fat-producing constituents, the superiority of palm-meal as a fattening food will clearly be recognised.

Taking 24 per cent. as the average portion of fat, and multiplying this by 2½, we obtain 60 per cent. as the starch-equivalent for the fat in palm-kernel meal. Add to this 35 per cent. in round numbers of other heat and fat-giving matters, such as sugar, gum, mucilage, &c., and we shall get that which is equivalent to 95 per cent. of fat-producers against 65 in wheat or barley.

Neither is this meal deficient in flesh-forming matters; and although for young growing stock the admixture in an equal proportion of beans, peas, or other leguminous food rich in nitrogenous matters, is advisable, for fattening stock the 15 or 16 per cent. of flesh-forming matters occurring in palm-meal are quite sufficient for carrying on the fattening process successfully.

At the present time palm-nut meal sells at £6 a ton, in quantities of 2 tons and upwards, delivered at Liverpool, or at £6, 17s. per ton or upwards delivered by rail in London, and is produced in England, as far as I know, only by Messrs Alexander Smith & Co., Kent Street Oil-Mills, Liverpool.

All the samples of foreign palm-kernel meal and cake which I had occasion to analyse I found greatly inferior to the Liverpool meal, as will appear from the following analysis, showing the

COMPOSITION OF FOREIGN (HAMBURG) PALM-NUT CAKE AND MEAL.

	Cake.		Meal.	
	No. 1.	No. 2.	No. 1.	No. 2.
Moisture	12·91	8·84	10·77	10·84
Fatty matters	9·48	11·27	13·79	12·49
*Albuminous matters (flesh-forming substances)	18·25	17·93	13·75	14·06
Mucilage, starch, sugar, and digestible fibre	39·16	40·79	42·67	43·56
Woody fibre (cellulose)	16·90	16·85	15·17	15·32
Mineral matters (ash)	3·30	4·32	3·85	3·73
	100·00	100·00	100·00	100·00
*Containing nitrogen	2·92	2·87	2·20	2·25

The chief difference between the English-made and imported samples of palm-nut meal consists in the very much larger proportion of fatty matter that occurs in the former samples.

Foreign palm-nut meal sells at a lower price than English, but will generally be found the dearer of the two if the quality be duly taken into account. The Hamburg meal has lately been the subject of feeding experiments in Germany, by Professor Stöckhard, of Tharandt, who gives a most favourable report of its fattening properties. This distinguished agricultural chemist also speaks highly of it as a food for milch cows.

The experience of English and continental feeders thus confirms the opinion which I first expressed on the strength of an analysis with some degree of diffidence, and leaves no doubt of the fact that in palm-kernel meal we possess a most valuable and economical addition to the list of feeding-stuffs.

11 Salisbury Square, Fleet Street, E.C.

The Veterinary Review and Stockowners' Journal.

CONSIDERATIONS ON THE RELATIVE CAPABILITIES OF ENGLAND AND FRANCE FOR PRODUCING HORSES OF HIGH MERIT.

THE speed and stoutness displayed by French-bred blood horses of late, has dispelled the long-cherished notions entertained, that the English race-horse, greyhound, bulldog, and gamecock, lose respectively their characteristic courage and enduring stamina when taken from the British soil to continental climes.

These ideas, when tested, are found to belong to the same stock as that formerly inculcated among schoolboys, of an Englishman being equal, in combat, to three Frenchmen. It was not until the present year that the really high form of race-horses of French produce became recognised; though some palpable demonstrations had been furnished in the appearance, on the English turf, of La Tocques, Fille de l'Air, Dollar, &c. Still, since one swallow does not make a summer, neither does one, nor a few, exceptionally good horses prove that the relative positions of the two nations for horse-producing celebrity has become of a sudden changed.

Facts become more reliable as they recur at intervening periods, the attribute of accident vanishes by repetition, and people prepare to entertain the notion of causes, and of necessity their relation to effects become manifest with time.

Gladiateur is only a brilliant repetition of the high-class race-horses which France—to her honour, and for England's instruction—is sending to compete against those of our justly long-renowned, first among horse-producing nations. Not the least important fact to be noticed is, that when the French produce a fast horse, it is usually a stayer, not only technically so speaking, but a stayer on the turf for two or three years at least, before losing his speed. Fille de l'Air has been for three successive seasons the best among her sex of *her age;* and at the beginning of the present season she proved her-

self to be the best four-year-old at Newmarket, amongst both colts and fillies.

The much ado about this year's Derby recalls to mind that the lessons of last year were not effective. The superior style of the French filly, winner of the Oaks at Epsom, the Newmarket Oaks, and Newmarket Derby also,—besides, Dollar being the best four-year-old horse in England, and Gladiateur, the best two-year-old colt,—altogether these created very little notice compared to the great achievements of Blair Athol.

The victory of Vermont over the English Derby winner created but a three-days' surprise, and was then left to subside as if the feat had never happened. Blair Athol returned, and by beating Ely and others at Ascot, showed his Derby form was not lost, and it was agreed that the race for the "Grand Prix de Paris" was "a fluke," that the English horse had been hurried from Epsom to France, and could not have been right at the Paris meeting.

As our object in referring to this event of the past is to establish the truth, we will see how the matter stands,—and, firstly, what evidence is there of the race for the Grand Prix at Paris, in 1864, being a "fluke?" In the first place, we admit the risk of moving horses to long distances shortly previous to the time appointed to run an important race; but race-horses are so accustomed to travel by rail, that they are less disturbed than ordinary horses; it is of everyday occurrence to travel them by rail from one meeting to another, which ordeal they sustain with apparent impunity. That Blair Athol reached Paris safely from Epsom, after his Derby contest, was never put in question until he was defeated, and to show that there was no foundation for that excuse, several collateral facts may be adduced. Firstly, Fille de l'Air, who had also travelled to Paris after her Oaks victory, ran in the race for the Grand Prix, and was beaten by the Derby horse about as far as good judges might have expected she would have been. While to prove the correctness of her form, the Oaks mare beat the winner of the French Derby and Baronello, two known good horses, in the same race. Immediately after the great race at Paris, both Blair Athol and Fille de l'Air were hurried back to England, both ran, and proved victorious at Ascot —the former beating one of the best and most reliable of his Derby competitors, Ely, thereby proving that Blair Athol had not lost form, even by the journey from Paris subsequently to his running there a much more severe race than he had encountered at Epsom. However,

it is well known, and would have required no repeating had it not been so soon forgotten, that as the racing season passed on, and the St Leger stakes were won by the Derby winner, the victories only were remembered, and the important defeat was left to subside as if it had never happened. But, as has been said, facts repeat themselves. We have the Paris form which Vermont displayed in June, repeated at Baden in September, where, over a two-and-a-quarter-mile course, he beat Fille de l'Air, and that excellent horse Dollar, with several others.

That Blair Athol proved himself to be the best three-year-old in England by winning all his home engagements, including both Derby and St Leger, in no degree militates against the established fact, that he met with a better horse than himself in France.

In the present year, France fully sustains her superiority in the form of her horses on the turf, as shown both at home and in England, though we out-do them so incomparably for numbers. Three French horses have, up to this date, middle of June, proved themselves to be the best of their respective ages amongst the horses in England with which they have competed; these, it need hardly be said, are the five-year-old Dollar, the four-year-old Fille de l'Air, and the three-year-old Gladiateur, with, moreover, a two-year-old (Young Monarque) threatening.

There is an old saying, that facts are stubborn things; yet the task of explaining them away in the question before us is pretty generally and most industriously taken up. For our own part, we accept the proof as it stands, and proceed to the question of causes. Some have been so industrious as to discover in France a climate more congenial to the horse than that of England. An incident may be referred to, which, by comparison, may help to illustrate this subject. On paying a visit to a friend recently, we saw lying on his table a gold medal, awarded by the French Emperor for the finest specimen of grapes exhibited at the last International Exhibition at Paris. The grapes for which the prize was awarded were grown in Scotland, and with which none of French production could compare. Now, what would be said if, taking this well-established fact, men hastily made a partial analysis of it, drew false conclusions, and acted according to this new hypothesis about the climate of France being accountable for the superiority of their horses? They might say that Scotland is the country pre-eminently favoured for the growth of grapes; and so determining, the vine-clad hills of France might be reduced to grass

fields, while the process of stubbing up the heaths and planting the Lammermoors with vines should follow as the sequel.

Better reasoners would look into the matter, when it would come out in proof that in horse-production and grape-growing, special talents are essential, and to their industrious application is due the good results in both cases. The truth that men prize most the things they have not, and omit to cultivate those within command, is here made clear.

While the soil and climate of Old England are burdened with the blame of the defeat of our race-horses, writers take care to concede nothing to French skill and good management. Their horses, it is said, are all the produce of English stock; they are attended by English grooms, and ridden by English jockeys. The very fact that foreigners employ Englishmen, precisely where their talents are acknowledged to be in advance, speaks volumes for their sagacity and unprejudiced good feeling towards us. That man, however, would show utter want of knowledge of French generalship who supposed that any of their own resources were abandoned through their availing themselves of the English groom and jockey.

Then with regard to their horses being of English stock. Proof again of good judgment: there are no horses in the world like the English, and no country in Europe so favourable for their production. But how is it that the French improve on our stock? It is said that they buy many of England's best horses. Granted, but hardly any of these have left England before they had served several seasons, and some were getting to be old horses when they left. And as for the brood mares they import from us, they form a mere fractional part of what can well be spared. There is really no want of excellent thoroughbred mares in England; and only knowledge and means are required in order, within a short space of time, to procure a collection. The Baron and Wormsley are almost the only two horses that we remember to have been exported to France soon after their career as stallions was begun, and their exportation was regretted, through the goodness their stock early displayed. Ion was an old horse when he was exported, just before Wild Dayrell won the Derby and Lanercost had filled the country with mares, and left several of his sons to succeed him, while the Flying Dutchman had begun to be looked down upon, was said not to impart stoutness to his stock, and we heard talk of his slack loin and calf knees, while we never could succeed in discovering either. However, either French climate, or French treatment, has answered

well, for the Dutchman has sent a better son across the channel to beat our horses, than any he produced while he stayed at home, numerous though his winning progeny were.

The main question to be dealt with, to account for the superiority of their small number of blood horses, resolves itself into one on management. The thing wanted is a well developed sound horse, and, having him, to understand how to keep him sound. On these the French are most successful. Whether they treat their race-horses worse than they do their common horses, as tending to their state of soundness, we can only speak with some reserve; judging, however, from results, we are led to believe that they have not abandoned the good parts of their horse management while engrafting English accomplishments so happily; while looking at home, we are prepared to say that the management, as it affects the state of soundness, or rather, as it tends to engender unsoundness of race-horses, requires thorough and systematic reform.

There is one mistake which it seems to us that the London sporting journalists are making, in their taking a view of the great race at Paris. On Saturday the 10th, we find the following in *Bell's Life:* —" The Grand Prix de Paris.—Up to the present moment there seems every probability that the field will merely comprise the winners of the English and French Derbys—Gladiateur and Gontran. This uninteresting state of affairs must show the authorities that some alterations are required in the conditions, and we should recommend for the future that the winners of the English Derby and the French should both carry penalties of 7 lb."

Some other journals make similar remarks; the inconsistency of which is manifest, when it is considered that up to the present time no English-bred horse—winner of the Derby—has yet won the Grand Prix at Paris. Nor has the French Derby winner succeeded in carrying off that prize.

The circumstance which has happened this year, of a French-bred horse winning the English Derby, and then going over and beating the French Derby winner for the Grand Prize, is one that probably will not soon be repeated. That horse and his management must command the admiration of all turf amateurs; the result, we maintain, calls for no interference with the established regulations of the race as regards penalties. The distance run is of itself quite sufficient to alter the chances in the race, as has been made clear in each of the three years since its establishment.

One change, if by representation and solicitation it could be brought about, would be gratefully acknowledged by the English, viz., fixing of the race for the "Grand Prix de Paris" for the Saturday or Monday, instead of Sunday as hitherto. The meeting extends over two days, and it would be a gracious act on the part of the Emperor, if his Majesty were to decide that, in future, the grand event should come off on a week day. The English, the ladies in particular, would no doubt join in great numbers with such alteration of the programme at the Paris meeting in June. To those who may be called the working men in the business—trainers and jockeys, they being nearly all English—the change would be a boon. Any other alterations of time, with a view to suit our horses, must fail to please all parties,—so close together do the great meetings come about that time; and it would be as impolitic to try to enable any one horse to win three of the greatest races of the year within a week, as it would be to impede the winner of one of them by penalty from becoming the winner of a second or third.

The Emperor of the French right imperially gave what had been loudly called for, a great prize, for which the horses are made to run over a long distance to test their stamina. The throwing it open to all the world, on equal terms, is most liberal. As the distance of the Grand Prix course (that of the French Derby) is about three furlongs more than the course for the Epsom Derby, and at least one furlong more than the St Leger course, it remains to be seen how often the same horse will carry off any one of the three shorter distance races, and then additionally win the mile and seven furlongs Paris prize. The French have now won their own grand stakes twice out of three times; and, judging from the stoutness of their horses, they bid well for contesting closely with all comers. And "Good luck to the best horse, whencesoever he comes," is our motto.

GLADIATEUR A TYPICAL HORSE.

On the 3d of June, *Bell's Life* gave the following description of the French race-horse Gladiateur:—"He stands nearly 16 hands 1 inch high, his body runs rather light towards the flanks, has a very deep girth, and, like his sire, Monarque, he is slack behind the saddle, and high in the rump; his hips are very wide, *but his hocks and knees are very high from the ground.*"

The latter part of the last sentence calls for remark from us, as it is several years since attention was first directed to the fact in the pages of this periodical, that length of the component structures, which make up the fore and hind limbs of the horse, from the knee and hock inclusive, to the ground, determine, other essential conditions being equal, the degree of speed and enduring power of the animal.

No pains have been spared on our part to make the matter clear. Phenomena have been shown, and the subject treated variously, and published in several sporting journals, besides many times treated on in the Edinburgh *Veterinary Review.*

It never once occurred to us that a horse would have to be brought from the continent to win the Derby, before men's eyes became open to truths that a child might see. If, however, the effect of Gladiateur's proved superiority to all our best horses, which he met at Newmarket and Epsom, leads to due appreciation of perfect construction, instead of relying on false notions; the hundred thousand pounds said to have gone from this to the other side of the Channel with the horse, need not be regretted. Such a sum would do but little towards covering the loss in horses which the making out of a few important truths would save.

Philosophers tell us that language is the key to science, but surely the question cuts two ways; and that understanding imparts meaning, light, and life to language; while nothing tends to hinder the progress of knowledge so much as dominant erroneous descriptions, which are perpetually taking people the wrong way.

We knew that it was only a question of time, when the millions would be relieved from reading reports of horses and studs thus:—Stands 16-2, on very short legs; has a back barely affording space for the saddle, gaskins well let down, hocks close to the ground, and there is but just room to span the fore leg between the knee and fetlock. That is the stuff served to English readers. How it must perplex translators, especially critics on common sense!

All this is changed now. It is no mere expounder of the physiology of progression, but the leading London sporting weekly paper, which has told the world that the last Derby winner has "his hocks and knees very high from the ground." The same authority will render public service by naming those winners of the Derby, Oaks, and St Leger who he believes had their hocks and knees near the ground. Meanwhile we assert, that no horse ever did, or can, win any one of

these, or other great race where the best of English blood-horses run, whose knees and hocks lack in wonted distance from the ground. There is no form or component part in the construction of the horse that can compensate for length in the regions referred to. Contrast often proves effectual in bringing home conviction, even when difference is sought to be shown, and is not found.

However, since Gladiateur ranks among the large-sized of Derby winners, and for all that has been shown to the contrary, he may be one of the fastest and stoutest horses that ever won that race, it is to the same extent consistent and probable that his hocks and knees are about as high from the ground as the same parts of any one of the most renowned horses of past years.

THE ALBERT VETERINARY COLLEGE (LIMITED.)

THE advertising columns of the daily and agricultural papers have widely disseminated the information, that a company is being formed for the purchase and transfer of the New Veterinary College from Edinburgh to London. Our readers may, perhaps, think that a statement on the subject should have appeared first in these pages. The explanation we have to give is, that as the formation of the London company was entirely independent of ourselves, and we had only agreed to transfer on certain conditions being accepted by a body of gentlemen in London, it would have been premature for us to have said a word until the transfer could be regarded as almost an accomplished fact. From the hostile attitude and malicious insinuations of those who preach more than practise on the great subject of professional union, it appears necessary that we should state briefly how the present movement has been brought about. As far back as 1862, when we were engaged in a government inquiry, it was suggested to us by eminent men in London that an effort should be made to remove the New Veterinary College from Edinburgh to London. We strenuously opposed the idea. In the month of May 1863 the proposal was renewed; and in 1864, after personal inquiries and experience of the working of the New Veterinary College by a gentleman resident in London, an offer was made which we felt bound at all events to consider. The patrons of the New Veterinary College were informed of the proposals, and however much they might regret the transfer of the institution, they saw that the

work so vigorously carried on during the past eight years in Edinburgh, would prosper to an extent not to be equalled in any sphere of action more limited than that of the metropolis.

The vigorous manner in which the project was worked at in London soon placed it in so hopeful and desirable a position, that terms were offered, which, in the interest of our college, of its professors, its students, and the cause for which we had worked, could not be refused. We had not directly or indirectly sought the opportunity for such a transfer. We were thrice solicited, and at last acceded to the proposal, simply because refusal would have been folly.

Under the circumstances, we may perhaps be excused if we pass in review some of the leading points in the history of the New Veterinary College. It was established in 1857, for the purpose of improving the state of Veterinary education in this country. The object was not to begin, as the old Colleges did, with one Professor giving three or four lectures a week, and then, after twenty or thirty years' existence, doing something more; but, on the contrary, to start with as good a staff of teachers as could be procured, and with other means of teaching in accordance with the requirements of the day. The difficulties we had to encounter were enormous, and not the least were those set in our way by the old Colleges, who opposed, to the best of their ability, the granting of the Royal sign-manual in our behalf. That opposition we broke through, and with what effect is well known to the Royal College of Veterinary Surgeons, and especially to its treasurer, who has since been able to calculate on large annual remittances from Edinburgh. The first efforts in the New College were directed to training teachers; and aided, as we were, by able colleagues, our success in that direction has, in relation to time, certainly been greater than that of the older institutions. Young men of ability were not allowed to work without proper guides and assistance as elsewhere, but help was freely tendered to all who could and would help themselves. We can appeal with confidence to the examiners of the Royal College of Veterinary Surgeons as to the ever-improving character of the students they have examined. What other Veterinary College in this country has ever afforded enterprising young men the advantages in the shape of pecuniary aid which the New College has given them? Scholarships of £25 and £50 a-year have been common rewards; and the result has been the training of high-class men, who would do honour to any educational institution in the country.

There are other ways in which we can demonstrate that we have steadily held in view and successfully promoted the objects for which the College was established. The volumes of this Journal, the "Veterinarian's Vade Mecum," the "General and Descriptive Anatomy of the Domestic Animals," and the "Domestic Animals in Health and Disease," afford direct evidence of attempts which, we venture to think, have not been unsuccessful in improving the state of Veterinary literature. Every one of the treatises published has met with an excellent reception, and no less than 7500 copies of the first part of our "Domestic Animals in Health and Disease" have been already sold, and every succeeding part is moving off in proportion. It is needless here to refer to the numerous articles published in medical and other periodicals, to the inquiries as to the health of stock in the country, official reports, &c. We challenge comparison with the old institutions in the amount and quality of the work done, notwithstanding that the New College has existed only eight years, and the St Pancras Institution since 1791.

Those that win may laugh. We can afford to deal more tenderly with the editors of *The Veterinarian* than they seem disposed to deal with us. They have vomited forth venom which must re-act on themselves; and this is proved by the kind letters we have received, expressing the great disgust with which an article in last month's *Veterinarian* has been read by old pupils of the London College, who can now appreciate the sincerity of those who are never tired of crying out, "*Vis unita fortior.*"

ROYAL COLLEGE OF VETERINARY SURGEONS.

SPECIAL MEETING OF THE COUNCIL, HELD MAY 30.

Present—Professors Spooner, Simonds, Varnell, and Gamgee; Messrs Broad, Brown, Cartledge, Coates, Dickens, Greaves, Harpley, Harrison, Hunt, Lawson, Mavor, Moon, Pritchard, Robinson, Silvester, Wilkinson, and Withers.

It was moved by Mr Wilkinson, and seconded by Mr Lawson, "That R. Le Hunt, Esq., the late president, take the chair."—Carried.

The minutes of the preceding meeting were read and confirmed.

The election of a president for the ensuing year was then proceeded with, when it was moved by Mr Robinson, and seconded by Mr Mavor, "That Professor Varnell be elected president."

On the ballot being taken, Professor Varnell was declared unanimously elected.

Professor Varnell having taken the chair, returned thanks for the honour of his election.

It was moved by Mr Silvester, and seconded by Professor Gamgee, "That a vote of thanks be given to the late president, Mr Hunt, for the very able and courteous manner in which he had discharged the duties of his office during the past year."—Carried.

Mr Hunt returned thanks, and at the same time handed to the president the official key of the Royal Charter and College Seal.

The election of six vice-presidents was then proceeded with. The following gentlemen were proposed:—Mr C. Hunting, by Mr Cartledge; Mr Robert Lucas, by Mr Lawson; Mr W. Burley, by Mr Silvester; Mr W. Field, jun., by Mr Robinson; Mr W. Thacker, by Mr Harrison; Mr Jas. Broad, by Mr Wilkinson; Mr Jas. Rose, by Professor Simonds; Mr W. Wheatley, by Mr Pritchard; Mr J. Barford, by Mr Dickens.

The result of the ballot was, for Mr Burley, 19; Mr Lucas, 17; Mr W. Field, jun., 17; Mr Thacker, 16; Mr Hunting, 14; Mr Rose, 11; Mr Broad, 8; Mr Wheatley, 5; and Mr Barford, 5.

Whereupon Messrs Burley, Lucas, Field, Thacker, Hunting, and Rose were declared duly elected.

The election of a treasurer, in the place of the late Mr E. Braby, was next proceeded with.

It was moved by Mr Wilkinson, and seconded by Mr Lawson, "That Mr S. H. Withers be elected treasurer."

On the ballot being taken, Mr Withers was declared to be duly *elected.*

It was moved by Professor Simonds, and seconded by Mr Cartledge, "That Mr Coates be re-elected secretary and registrar."

On the ballot being taken, Mr Coates was declared to be unanimously elected.

Previous to the termination of the meeting, it was moved by Mr Dickens, and seconded by Mr Silvester, "That a letter of condolence be forwarded by the secretary to the family of the late Mr E. Braby, who had so ably officiated as treasurer, and won for himself the esteem and friendship of every member of the Council."—Carried.

By order of the Council,

WM. HENRY COATES, *Secretary.*

PERISCOPE.

Remarks on a Common Herpetic Epizöotic Affection, and on its Alleged Frequen Transmission to the Human Subject. By Dr WILLIAM FRAZER, Lecturer on Materia Medica to the Carmichael School of Medicine, &c.*

EARLY in March I was requested to attend a little child, about four years of age, who had contracted an eruption of the skin from playing with a calf whilst visiting at a farm-house on the borders of Kildare and County Wicklow. I was informed that the rash had been much worse, but was now improving under the use of a mixture of linseed oil and castor oil applied topically, in fact the same treatment which had been successfully employed with the diseased calf. I found a well-developed and characteristic patch of herpes circinatus or ordinary ringworm occupying the upper and back part of the fore-arm and elbow, fully three inches in length, and above one and a half inch wide, healing in its centre, but surrounded by a pale pink erythematous border that had passed into the chronic stage and was throwing off small scales, and ceasing to spread. A few days' treatment with very dilute ointment of red iodide of mercury perfectly removed all trace of the disease in the same manner that I have known it invariably to succeed in ordinary cases of this herpetic affection. As my acquaintance with cutaneous maladies occurring in animals was limited, my interest was much excited by the information I received as to the frequent appearance of this contagious herpetic eruption in calves, and its alleged transmission to the human race, which was said to be common and notorious. I therefore sought for some more information, and think that the results of my inquiries may possibly interest others in the profession. Should our country friends, who must know far more of this subject than those whose daily life is restricted to a town, be able to throw additional light upon the matter, they may be assured that, for one, I shall feel most grateful for their correction or confirmation of what I state.

So far as the history of the present case goes, the source of the disease appears to be ascertained beyond the smallest doubt. The farm where it occurred is one of the best conducted in Ireland, and is celebrated for the high character of the stock. For months previous no herpes whatever had existed amongst their own cattle; the calves, two in number, which were infected with the herpes were fresh purchases of high bred and expensive animals; both had the disease in a well marked stage on their face and neck, which was immediately recognised; they were purchased whilst the child was on a visit, and it was continually, from that time, in the habit of playing with them and of feeding them; its arm soon became attacked; and previous experience had taught the family that the cause of the infection was the rash upon the animals which they knew to be contagious, spreading alike to men and cattle who came in contact with it, and, as they informed me, when neglected, it would cause "very sore spots" on the face, beard, and limbs of those who were its recipients. The ordinary remedy they were in the habit of applying on the farm was mercurial ointment, though of late they have tried the mixture of linseed oil and castor oil, as they considered, with success. The ringworm appears always to show upon newly purchased animals; and, though it is liable to extend through their own stock, the impression seemed to be that it was invariably propagated by direct contagion, and never originated spontaneously.

The inquiries which I have made in different quarters would induce me to believe that epizöotic herpes must be very unequally distributed; it has extensively prevailed in some localities like an epidemic; others, as certain parts of Wicklow and County Dublin, were reported to me as being perfectly free from its presence; but this interesting question would demand far more research than I have been able to enter upon as yet. In the Counties of Cavan and of Monaghan it seems to have been of common occurrence and generally recognised; I therefore append two reports relating to parts of these counties which were written by pupils and personal friends of mine. I have every confidence in the strict accuracy and powers of observation of these gentlemen, who were neither of them aware that the other was engaged in writing on the subject or of my own special interest in it. I merely inquired from each separately, did they know anything about the occurrence of ringworm or herpes in calves

* From the *Dublin Quarterly Journal of Medical Science*, May 1865.

and its usual treatment, and, if so, to write for me a brief account of the disease as it had fallen under their notice, and, particularly, did they think it liable to attack human beings?

Observations on Ringworm in Cattle. By Mr Patrick Brady, *as he has observed the disease in County Cavan.*

Ringworm chiefly occurs in calves and young cattle, but is not unfrequently seen in the cow. It is noticed most frequently during the spring months and in the early part of summer. It forms round spreading patches, reaching from less than an inch to two or three inches across, smooth in the centre and rougher round the border; they continue to extend for some time, then dry up, and finally the spot appears covered with a crust of scales, thickest outside; the hair covering the part attacked falls off, leaving the skin bare, and so produces much disfiguration. The favourite situation of the eruption is about the eyes, the roots of the ears, and on the neck, but it may also occur upon the body and over the limbs. There can be no doubt that it is highly infectious, as when a cow or a calf having the disease is brought amongst others that are not affected by it, the eruption speedily appears amongst them, perhaps in consequence of their rubbing themselves against the same post as the infected animal.

Man is not without danger of being infected either. Herds, milkmaids, and children that are in the habit of playing with calves, are most frequently attacked. When the rash appears on the human subject, it is very difficult to manage. I have seen it most often on the head and arms; it may also occupy the face, and is particularly troublesome when it gets into the beard; sometimes it appears on the trunk of the body, though far less frequently than on the hands, arms, or face. In man the eruption is very similar to what we observe in the calf: it comes out as a reddish-coloured spreading round spot, which may extend until it forms a patch like a "fairy ring" of considerable size; its course is very chronic; often the part gets inflamed, throws out a crust, and cracks if neglected, forming fissures; at other times the crust dries, and appears as a mass of scales.

Treatment in Man.—In some cases I saw the liq. plumbi. subacet. used with success; compound tincture of iodine is another local application, which I also saw used with good results. When very obstinate, the part is brushed over twice in the day with strong acetic acid, and artificial Harrowgate water given internally. I scarcely ever have known this to fail in curing the disease.

Treatment in Cattle.—For cattle the only treatment I ever saw used was some irritating ointment. The best appeared to be a preparation of corrosive sublimate made from bichloride of mercury, twelve grains; lard, one ounce; powdered white hellebore, sixty grains.—Mix.

Ringworm in Cattle. Notes by Mr James Whitla, *as he has observed it in County Monaghan.*

In some parts of the country the practice is followed, to a limited extent, of buying up, at a very cheap rate, numbers of calves from four to eight or nine months old, about the middle and end of autumn, and placing them through the winter to graze, in large batches, on very poor grass land. Towards the end of the winter they are generally sold off to other proprietors to be fattened for the butcher, army contractor, &c. The state in which they come off their winter quarters is in the majority of cases most miserable; they are almost completely devoid of flesh, drooped, listless, and bearing evident marks of starvation; they are *totally denuded of hair round their eyes*, and large patches over the body in the same condition, nearly all the patches being of a circular form. Such a state is easily altered by a little better care, and the due admixture of salt with their fodder. I wish to draw your attention to this, because it is a condition of things very often confounded with genuine ringworm in cattle, but it must be looked on as altogether different. Still, this much is certain, that all cattle in such bad condition as I have described are vastly more liable to outbreaks of true ringworm than those which are housed during the winter, well fed, and in good condition when they are placed out for grazing in spring.

Ringworm in cows or calves commences with a single spot, which after a few days develops itself into a small, ring-like, scaly eruption, growing larger by additions to its outer circumference, so that it increases in a manner perfectly similar to "fairy-rings" in a meadow; at the same time the hairs fall out, and the interior, losing its scales, appears comparatively smooth. If the first spot of the eruption happens to be seated on a part of the animal within reach of being licked by the tongue or lips, other spots are speedily produced over different parts of the body; and in the course of a week or ten days may be seen reaching from the size of a fourpenny piece to that of a ring of two or three inches in diameter. At the same time the animal fails in flesh, its milk is diminished, and its aspect is truly pitiable; the irritation and itching of the several spots keep it in a state of continual motion—licking, twitching, and scraping with the hoof. I cannot doubt that this eruption is capable of being widely and rapidly disseminated by contact alone, for during the second year of my apprenticeship in the North, I had abundant evidence of the fact—whole tracts of country, let in grazing, becoming annoyed with the pest of ringworm, owing to the introduction of one infected animal from a different locality.

That ringworm is constantly transmitted to the human subject admits of no doubt, for during the first prevalence of the disease in the cattle the animals suffering from it were somewhat too closely, and at the same time carelessly, examined by their owners, servants, and others. The consequence was that it soon became nearly as common amongst the people themselves as with the cattle, first appearing as a rash upon the most exposed parts, the back of the hands, the face, or neck, and if unchecked, spreading from these to other parts of the body, irrespective of position.

At this distance of time (some four years) I cannot, unaided by notes, describe minutely any particular cases, but they were numerous, and the eruption presented identical features both in men and animals. However, I remember one man who was attacked in a very severe manner, and his case is the more worthy of being cited, as the people in his neighbourhood were convinced that he died from the disease communicated, as all knew, by the cattle. He was manager and caretaker on a farm held by a widow; the cows, calves, and, I believe, bullocks under his charge, had been affected with ringworm for some time. On the recommendation of a locally-celebrated "medicine man," he applied to the cattle strong mercurial ointment, rubbing it several times in the day to the spots of eruption. In a short time the rash appeared on his hands, face, neck, and arms, several developing themselves in a very severe manner about the jaw and the angles of the mouth. Having found his blue ointment so successful with the cattle, he commenced its free application to all the spots on himself, regardless of situation, appearance, or condition, and in a short time had banished most of them, but so severely salivated himself, that he died in about a fortnight. Such a case occurring in the neighbourhood of a country town naturally caused a panic, and led to a more careful and better advised mode of treatment, before which the disease gradually gave way. This consisted in the use of iodated sulphur ointment, varying in strength from five to forty grains of sulphur iodatum, mixed with simple cerate, one ounce. The same treatment invariably proved successful when tried with those persons who had been infected from the cattle, occasionally using mild astringent ointments where they appeared to be indicated, such as unguentum zinci and unguentum calaminæ.

The different forms of epizöotic eruptive disease have not as yet received from the medical profession the attention that they would appear to deserve; they are either totally ignored or passed over in the most superficial manner in all our numerous treatises on cutaneous medicine, nor do the usual veterinary manuals greatly aid our study of them; their descriptions of skin diseases are often loose and worthless, and their pathology and practice most defective. In one of the latest of these publications, which may be taken as representing the state of our literature in the present day relating to bovine maladies, herpes in cattle is described with some approach to accuracy; we have also a clear statement of its decidedly contagious nature, and of its liability to infect either animals or man—I allude to the recent work of Mr J. R. Dobson—"The Ox, His Diseases, and their Treatment. London, 1864. Published by Messrs Longman and Co.," from which the following extract is taken:—

"Ringworm, although a disease almost unnoticed by veterinary authors, is by no means rare in young stock, and is occasionally found in older animals. Debility and poverty seem to be the great predisposing causes. It is, in fact, a disease of deranged nutrition, or, to use common parlance, of 'poorness of blood.'

"Ringworm is, in the author's experience, a very contagious disease, although this *is denied by* very eminent medical authors. In fact, in two well-marked instances,

the author has witnessed its transference from the horse to man, and more frequently from the ox to the horse. Although the name ringworm might lead the non-medical observer to suppose it owing to some living parasite, it is not so. The disease is centred in and owing to an affection of the skin itself.

"Several varieties of the disease are described by medical authors, but probably the ox is not liable to more than one—at all events, a description of the more common affection will suffice for all practical purposes.

"The symptoms of ringworm are the appearance of a number of round scabby patches, about the size of half-a-crown, which, when peeled off with the finger, exhibit a rawish surface underneath, discharging a yellowish exudation, which, when dry, forms the scab above alluded to. Occasionally one or more of these rings run together, and form a patch of some magnitude, although a well-defined *ring* may always be seen. They are usually found about the head and neck, the back and thighs; but, surrounding the eyes, they are often found in great numbers, giving a most unsightly appearance to the animal.

"The treatment should commence by a careful attention to the diet, and an exhibition of more generous food. Medical alteratives may, too, be administered—as, flour of sulphur, one ounce, black sulphuret of antimony, half ounce, in one powder, which may be given daily. With regard to local treatment, the mange liniment may be applied—oil of tar, oil of turpentine, linseed oil, equal parts, rub well into the skin every other day; or one of the two following applications—tincture of iodine, painted on with a camel-hair brush after the scab has been removed, or lunar caustic, twenty grains, distilled water, one ounce, to be *well rubbed* in with a small tooth brush. These may be alternated with the solution of bichloride of mercury, the ointment of hellebore, or any of the stronger acids. Cleanliness in this, as in all other skin diseases, is essential."

Although the list of our systematic treatises afford us so limited and defective a description of this important eruption, yet it has not been altogether overlooked by Continental authorities, and I would particularly refer to a paper by M. Gerlach, Professor at the Royal Veterinary School of Berlin, which contains much more definite views respecting the nature and character of epizöotic herpes. The essay is briefly reported in the valuable periodical edited by Mr Gamgee, *The Edinburgh Veterinary Review*, Vol. II., for 1859–60. M. Gerlach gives an admirable description of the eruption, its appearance and progress, and satisfactorily identifies it with herpes circinatus, (the tinea circinata of writers, when it occurs in the parts covered with hair of human beings,) for he procured from its crusts the same parasitic vegetative growth (trichophyton tonsurans) which is present in that disease. He further effected its transmission to oxen, horses, and dogs, but failed to induce it in sheep or pigs. He inoculated his own arm, and also some of his pupils, with the crusts taken from oxen, and in every instance a patch of herpes circinatus was developed, the crusts of which "contained the vegetable parasite observed in the *dartres* of the ox." M. Gerlach's paper enumerates several authentic cases of the transmission of the disease to human beings from animals, derived from French and German sources, which it is unnecessary to particularise, as the abstract of his essay is easily accessible. I have not as yet had any opportunity of examining the microscopic appearance of the disease in the calf, but I obtained some hairs which were taken from the vicinity of the affected part in a calf from the County Cavan, and around their bulbs I got distinct proof of the presence of a parasitic cryptogam that was apparently identical with trichophyton, but in too imperfect a condition for me to figure it. As for the child, when I was consulted, the eruption was already disposed to heal, and therefore unfavourable for microscopic observation.

BLACK QUARTER IN CATTLE.

(*From the Scottish Farmer.*)

THE blood diseases known as *black quarter* and *splenic apoplexy* are among the most troublesome with which the farmer has to do. When his cattle are in the most satisfactory and thriving condition—when they are rapidly recovering that state of repletion of which some debilitating influences have deprived them—and when the owner's hopes of them are at their highest, then it is that this dire enemy stalks into his fold, and in a few days, or even hours, the very cream of his stock is destroyed. None the less are these diseases to be dreaded, and their occurrence provided against,

that they can in certain circumstances be communicated by the blood of the animal affected to others of the same and also of different species, not even excepting man himself.

The symptoms of black quarter are too familiar to demand any lengthened description. The dull, listless appearance of the patient, as it stands with arched back apart from its companions; its disinclination to move, and stiff gait when made to do so; the haggard countenance, bloodshot lustreless eyes, dry muzzle, hot mouth, horns, and skin generally; the full, quick pulse, the accelerated and moaning respiration, and the extreme tenderness on pressure of the back and loins, as well as of other parts where the characteristic swelling is about to be developed, though it may not yet have done so, conveys at once to the mind of any one who has seen the disease the idea of its presence. Besides these, there may generally be noticed other symptoms, such as forcible beating of the heart, the impulse of which may be felt behind the left elbow, the drivelling of saliva from the protruding tongue, and the escape of blood from the nose. One of the most characteristic features is the crepitating noise, like that produced by crushing a piece of paper in the hand, when the skin is pressed in the region of the back and on the sides. This is due to the presence of gas in the connective tissues beneath the skin, and may be noticed before the peculiar swelling of the disease is observable. These local swellings are, however, usually present when the animal is first observed ill, and on pressure they give forth the same crepitating sound as above referred to. The tumours are often situated in the neighbourhood of some joint of a fore or hind limb, and hence the name of *joint felon* and *quarter ill*, though they are also met with in other parts of the body. They are situated in the connective tissues beneath the skin, especially where that is loose and abundant, in the vicinity of lymphatic glands, and in the substance of the muscles. The tumours rapidly increase in size, cover a great extent of surface, the skin covering them is tense, and, if white and not too thickly covered by skin, appears dark red or purple. If these tumours are cut into when well developed, the operation elicits no pain, and there escapes a bloody fluid of a tarry consistency and a dark red hue, mixed more or less abundantly with gas; it flows with a bubbling noise, and collects as a frothy mass around the wound. Round the margins of the tumour the liquid escaping from the incisions is not blood, but a yellow serous fluid with which the tissues are infiltrated. The textures which become the seat of the engorgement become rapidly gangrenous, and if the animal survive long enough, inflammation is set up in those immediately surrounding them. Coincidently with the appearance of the tumours, the general symptoms become modified, the pulse becomes small, weak, and irregular, the constitutional weakness increases, and the urine and fæces are tinged with blood. The surface of the tumour is colder than the surrounding skin, indicating the low state of its vitality and the approach of death in the part.

The tumours appear to consist essentially in extravasation of blood into the tissues, mixed up with and surrounded by a serous infiltration. They do not always exist in situations where their presence can be ascertained, but are, on the contrary, at times met with in the muscles beneath the backbone, in the region of the loins, and in internal organs, particularly the small intestines and other parts of the alimentary canal.

The local lesions are not always commensurate with the rapidly fatal progress of the disease: this last character must accordingly find its cause rather in the altered constitution of the blood generally, and the influence of this on the system at large.

The blood is profoundly altered, but varies in its character according to the virulence of the disease and the stage it has reached. In mild cases, in which alone recovery can be expected, and toward the onset of the disease, the blood has more of a natural appearance, but looks muddy, is fluid, and does not coagulate with the natural firmness, nor does it become so bright red when in contact with the air. In bad cases it has a thick, treacly appearance, has a dark red colour, even when drawn from the arteries, and does not coagulate on exposure to the air; or if otherwise, it forms only a very thin gelatinous mass from which the serum never separates, and which is broken up and restored to the condition of a tarry liquid by a slight agitation. The red globules are greatly increased in number, and many of them have lost their regular discoid forms, and present irregular notched or crenated edges. Davaine has also found in the blood of animals affected with the analogous disease *splenic apoplexy*, minute moving organisms, *bacteridia*, a kind of vibrio; and his observations are strengthened by Dr Crisp, who found similar bodies, but considered them simple acicular crystals. Virchow and others have noticed the presence of the vibrio in the blood in this class of diseases, and accordingly a strong probability exists that they are present in the whole order, and that they are even essential to their existence.

The lessened coagulability of the blood depends on the great diminution of the fibrine, which, according to Clement, is reduced by more than two-thirds of its normal amount. The proportion will doubtless vary in different cases; and from various causes, the principal of which is the rapid decomposition which such blood undergoes on exposure, no very accurate results can be expected from chemical investigation.

Since death, in the majority of cases of black quarter, takes place in from six to twenty-four hours after the onset, the chances of cure are slight, and attention is accordingly demanded rather to the means of prevention. In considering these, it is evident that were we conscious of the ultimate exciting cause of the disease, we might possibly be in a position to remove this source of danger, and thus strike at the root of the malady. Davaine's theory of the *bacteridia*, were it indisputable, would be the first step, and might lead to the discovery of their origin, and to the means of their exclusion from the animal system. Facts, indeed, strongly favour this theory. The bacteria not only exist in the blood of the affected ox, but also in the *malignant vesicle* which is developed in the human subject by inoculation with the former, and reinoculation of animals with the dried scab of the malignant pustule causes the development in these of the primary affection, and the production in their blood of numerous bacteridia. It is acknowledged on all hands, that though the disease does not appear communicable by the simple contact with diseased animals, yet it is always capable of being transmitted by inoculation. Hence, a little indiscretion may lead to dangerous results to attendants, or to other animals. No one with wounds on his hands should venture to touch the blood or textures of an animal in this condition. Some curious instances of contamination by inoculation have come under our notice. In one case, a number of young cattle, recently put to grass and rapidly thriving, were bled in succession because one of their number had been attacked by black quarter. Unfortunately, the operator, ignorant of any reason to dread the result, bled the sick animal first, and immediately proceeded with the others. The consequence was, that seven more died the same evening, the tumours having been rapidly developed on the neck and chest, spreading from the phlebotomy wound as a centre. In another instance, a shepherd skinned a bullock that had died the same morning of black quarter, and later in the day castrated several litters of pigs. Although he had washed his hands, and taken a turn among his sheep in the interval, the result was that all the pigs operated on died. The potency of the poison does not seem destructible by the digestive fluid, since pigs and dogs partaking of the fresh blood, or other parts of affected animals, are seized with violent sickness, vomiting and purging, and in many cases die.

It is not, however, certain whether the bacteria is the primary and essential cause of the disease, or whether they are only an accidental, though it may be constant, condition of its existence. Whatever the character of the virus, the researches of Davaine establish that it is capable of propagating the disease even after it has been dried; and if so, one can easily conceive of their being carried by the atmosphere. Propagation by particles carried in this way has not, however, been made out.

In this state of uncertainty regarding the real character of the morbid agent, it is satisfactory to know that there are certain conditions essential to its development in the animal system, and that by a careful avoidance of these its occurrence may be prevented, or at all events it may be kept within very narrow limits.

Among these secondary or predisposing causes, the principal are the conditions of soil, the weather, and the influence of diet.

Black quarter was formerly quite common in districts where at the present day it is unknown. These, however, instead of being more or less marshy, are now well drained and perfectly free from stagnation of aqueous and decomposing vegetable matter. The affection prevails annually on some retentive undrained clays, and in marshy soil, so much so that in certain districts cattle cannot be left on the low damp lands in spring and autumn, when it most prevails, without extreme risk of suffering from it. Removal to higher and dry pasture usually prevents its development. Much may in this case depend on the greater richness of the food; but independently of this, it is undoubted that drying of the land exerts a prophylactic influence; and in many instances drainage alone, without any decrease in the produce, has entirely checked the disease. At the same time, cattle, even in early life, when they are more susceptible, have been kept on such damp pastures adjacent to and in conditions apparently exactly similar to those suffering from the affection, and have not contracted it in consequence. While, then, such lands are favourable to its development, they do not seem capable of inducing it of themselves, nor do they appear essential

even to its production, as the malady is met with where no such conditions are found.

The state of the weather often appears to have considerable effect. Many outbreaks take place in close, warm, foggy weather, a condition favourable to the development of many of the lower forms of life, and which might be held to support the bacteridia theory; but, on the other hand, the malady will appear late in the season, and during the night, when the frost has been operating on the animal system. These conditions are, however, equally unfavourable to exercise, and to elimination of material from the body by the sweat and other secretions; and if the patient is at the same time full fed and rapidly thriving, the plethora is intensified, and the disease is thus indirectly fostered.

Diet has always been held to occupy a primary position in the development of this disease in animals in vigorous health. Attempts have been made to trace the origin of black quarter to parasitic productions on the fodder, and as many as twenty different cryptogamous growths have been mentioned by different authors as the probable deleterious agents. No importance is, however, attached to such agents, and the experimental use of fodder so affected in the feeding of animals for months at a time failed to produce any such affections. The real danger consists in the abundance of nutrient materials which the alimentary matters contain. It is the profusion of nutriment, and not the deficiency that kills. To this must, however, be joined a vigorous constitution, capable of the ready digestion and assimilation of these, or they will necessarily rest inactive. Most animals may be kept at the highest pitch of health even when growing, by keeping them constantly improving, and avoiding all sudden changes.

These conditions are very generally known, and yet we meet with breeders so blind to their interests as to allow their animals to fall off in condition at one season of the year, and endeavour to make up the leeway by extra feeding at another. In Aberdeenshire this is a common practice. Store cattle are sustained during the winter months on little else than straw and water; but for a few weeks in spring they receive a liberal allowance of cake to make them up for the grass, which has the result of inducing suddenly a dangerous plethora, and many fall victims to diseases of this class. In seasons such as the present, in which the animals have been unusually debilitated by the extreme prevalence of the foot and mouth disease, the ordinary conditions are aggravated, and, *cæteris paribus*, the cases are numerically increased. Steady progress is the great secret.

Some have questioned the statement that the most plethoric animal is on this account most strongly predisposed, but we believe chiefly on the ground that the best animals are not always the first to be attacked. In considering this question, it is essential to bear in mind that fat is not plethora, and that the most obese subjects often really contain less of the nutrient constituents of the blood than thinner and more active animals that take a proportionately larger share of food, and, it may be, are growing faster. The most belligerent of the herd may thus be the first attacked, though he be by no means the fattest.

Remedial measures, such as setons and purgatives, are occasionally employed to counteract the undue development of plethora. Of these two the setons are deservedly the most extensively employed. Many herds are regularly treated in this way with the greatest success. They act by establishing a drain on the system which interferes with the rapid development of a dangerous plethora. It must be added, however, that they are not infallible. Healthy systems will accommodate themselves to this as to any other drain, and by and by blood will be produced in correspondingly increased amount, so that the effect is ultimately lost. To employ setons rationally, they should only be allowed to remain in one or two months during the season, at which the animals are especially obnoxious to the affection, and ought to be removed before the system has become habituated to their action. Purgatives and diuretics, used weekly during the season of special susceptibility, have been found to exert a similarly beneficial effect.

CATTLE DISEASE IN ORKNEY.

The *Orcadian* of Tuesday says reports have been current for a few weeks back of the prevalence of disease to an alarming extent among the cattle in that quarter, but *that these reports* have been very much exaggerated. "It is true (says the *Orcadian*)

that a considerable number of cattle have suffered more or less severely from the disease, but few fatal cases have occurred. Every means are taken to prevent the spreading of the disease, and, so far as we have reports from the various parts of the main island, it is on the decline. We understand that the Aberdeen, Leith, and Clyde Shipping Company have taken the precaution to have the *Prince Consort* thoroughly cleaned and disinfected, and that they have employed Mr Teviotdale, V.S., to inspect all the cattle shipped in their vessel from Orkney."

The disease referred to, as appears from a lengthened paper on the subject by the fore-mentioned veterinary surgeon, is of the epizootic kind, supposed to be of continental origin, and to have been first observed in Britain about the year 1839. Mr Teviotdale says:—

"It was brought from Ireland in a herd of cattle in the autumn of 1840, to a farm in Kincardineshire, at which period I was a veterinary practitioner in that locality, and had the Irish invalids under my professional charge. At that period the occurrence produced considerable alarm and much excitement, none being acquainted with the specific characteristics of the disease, or qualified to form satisfactory conclusions as to its consequences. Under the circumstances, many unfounded and exaggerated reports were widely circulated regarding its contaminating influence and morbific effects; while many ridiculous, if not absurd, nostrums were recommended as well as adopted for its prevention and cure. Its peregrinations were often very mysterious and obscure; after hovering about in one locality for a period of more or less duration, it would suddenly disappear and reappear in another, varying from two to ten or twelve miles distant. It often returned to the same place in six or twelve months, affecting the animals that escaped its first visitation. Herds of cattle and flocks of sheep were often affected where it seemed very improbable that the contaminating poison could have been directly transmitted from the diseased to the healthy animals. It frequently disappeared in a locality without any known remedy being applied, reappearing in another without any apparent cause. Its mysterious movements seem to have been circumscribed to the southern counties for the period of six or seven years; for it did not appear north of the Dee until 1846, or early in 1847, when it became so prevalent in the eastern division of Aberdeenshire that few weeks past but the disease came under my observation in all its various types and characteristics. In Aberdeenshire this epizootic, in 1849, became considerably eclipsed by *pleura pneumonia*, equally obscure in its origin and peregrinations, and powerful in transmitting its contaminating influence, and in its consequences still more morbific and destructive.

"A disease similar to the present epizootic is reported to have been transmitted from the south to Orkney some ten or twelve years previous to this period, but at that time it only affected the cattle on one farm, when it disappeared. The report is probably correct, but I had not observed any type of the disease in this county for the last seven years until the middle of last month. Since that time it has been very prevalent in Kirkwall and its vicinity. Some of the animals have been only affected with a mild and very manageable type of the disease—others by a more dangerous type, and protracted illness; while some cases have been fatal."

Without expressing any decided opinion as to how the disease came to be imported into the Orkneys—whether directly with animals from the south, or by contagion wafted across the Pentland Firth—Mr Teviotdale goes on to the conclusion that it has rather increased than abated in its virulence since its first appearance in this country. He says that, under ordinary circumstances, although this disease is more manageable and easier subdued than some others, yet it is the most contagious he has ever seen. In all his experience of it, he had never known a diseased animal come in communication with healthy stock (either sheep or cattle) but all at no distant time became affected.

"The causes of the disease may be often obscure, but the symptoms generally can be readily detected by those who have closely observed its general characteristics. The affected animals first appear a little stiff about the joints and tender about the feet, sometimes lifting and shaking them as if they had been pricked, or if something were pinching them, and they are very unwilling to travel. Perhaps by next day they will be cowering down, the spine curved upwards, the feet kept far in below the belly, and, if standing, will be chopping with the mouth and lips, as if endeavouring to expel something from the mouth. The lips will appear thick and tumified, while more or less white foam or saliva will be observed about the lips and mouth. By examining the pulse, more or less fever will be apparent, and a slight trembling motion through the whole frame. By opening the mouth at this stage of

the disease, its internal surface will be found much inflamed, and most likely the skin removed or removing from the upper gum and the tongue, and sometimes the same will be the case with the nose and lower lip. If the feet be examined, the hoofs will be found partially removed, the remainder loose, and the whole division between the hoofs often raw and tender. In some violent cases the horns will be disengaged from the skin at their roots, and the hoofs loose from the back part to half-way forward to the point of the toe, the eyes and the nose often besmeared with white glutinous matter, and the animal will often stand shivering, while the general appearance is haggard and much broken down.

"In sheep, the disease often affects the eyes, lips, and feet. In violent cases they will be for some days blind. Swine get very lame, not willing to move, and complain much. Poultry are also sometimes affected, and continue very lame for a few days. I have not seen either dogs or horses affected with any type of this disease.

"The treatment of animals under this disease requires to be regulated and modified so as to be applicable to the existing circumstances. No formal modes will be suitable to the wants and peculiarities of individual cases. However, under all circumstances, when the disease is observed, be careful to keep the animal comfortable. Bleeding is only necessary when the animal is full in condition, and the fever apparently high. Laxative and fever medicines will be required, and are best adapted to modify the violence of the disease. The mouth, nose, and lips should be kept clean, and at least three times a-day be gargled with an astringent lotion. The feet also should be washed and kept clean, and in very bad cases enveloped in cloth and kept damp with cold water until such time as the inflammatory action subsides. The feet, after being cleaned, require to be well besmeared with ointment, or common fish or seal oil. In cases where they are raw and tender between the hoofs, a slight application of the chloride of antimony will facilitate the healthy action. Soft meat, linseed, oil-cake, or oatmeal gruel, should be given if required. The treatment of sheep is similar, only it requires to be modified to circumstances.

"This disease, though troublesome, is not deadly. Of late, however, I have met with a few cases that proved fatal. In neglected animals the feet are sometimes much destroyed. Milking cows, work oxen, and fat cattle, seem to be more severely affected than young animals in moderate condition. The disease, in general, will run its course, and health be restored, in ten or twelve days; while in violent and protracted cases this will take three weeks."

[The malady appears to be nothing more nor less, judging from Mr Teviotdale's description, than an aggravated form of the well-known foot-and-mouth disease.]

TYPHUS IN PIGS.

From the Scottish Farmer.

We remember once hearing an old woman remark, that "sows just required as much care and attention as bodies," and the truth of the observation is confirmed by the experience of all the largest and most successful breeders of pigs in the kingdom. Without cleanliness and comfort the human species cannot thrive: it is rendered more liable to all kinds of disorders; and kept in dirty styes, with little room and bad ventilation, and fed out of filthy troughs, swine languish, or, at the best, take on fat much less rapidly, and are more likely to fall a prey to the first epidemic reaching them, than if they had met with kind and liberal treatment. The occasion for the remark we have quoted above was the attack of a pig by measles, and the person who made it, was kindly treating "grumphy" to a cup of strong tea, in the hope that it might have a curative effect. There are other diseases than measles, however, to which "sows" as well as "bodies" are subject, and one of the last discovered of these is typhus. This malady formed the subject of a lecture last week, by Dr Budd of Clifton, to the Members of the Royal Agricultural Society of England. The doctor stated that his attention had first been directed to the matter by Professor Gamgee, of the New Veterinary College, Edinburgh, who wrote to him concerning an outbreak of this nature last August, and sent him one of the porcine victims for examination. He found in the intestinal canal similar ulcerations to those existing in human patients dying from typhoid fever. Dr Budd heard nothing more of the disease for several months afterwards, when it was intimated to him that ten pigs belonging to the Clifton Main Workhouse were affected with intestinal fever. He went over and

saw them, and visited them from day to day until they all died. With regard to the disease in the living animal, Dr Budd says :—

"I could not give you a better idea of it than by saying that it is the exact counterpart of typhoid fever in man. The phenomena are very nearly alike. There are one or two points of difference to which I shall presently refer; but they resemble one another very closely, only that this disorder in the pig appears to be more rapid in its course, and more deadly—killing, in fact, in a much shorter time. The earliest death occurred on the fourth day from the observation of the first symptoms; but probably that was not the fourth day of the disorder. The others died at various periods of the disorder, ranging from the 8th to the 10th, 12th, 16th, and the longest survivor lingered until the 20th day. The outbreak lasted in the whole about six weeks, which it is probably important to observe. I have said that the symptoms resembled in a general way those of typhoid fever in man. The pig began to droop, and shivered more or less very distinctly, suddenly became very prostrate, lost its appetite, got thirsty, and seemed very unwilling to be disturbed. The master of the workhouse said he believed that in the first stage of the disorder these pigs suffered from headache; and though this seems to be a curious statement, I have no doubt that it was a correct one. For in studying two of them at that stage of the disorder, one could hardly fail, from their heavy look, the fixed way in which they held their heads, and the resistance they offered to their heads being disturbed, to come to the conclusion that they were suffering from headache. These various symptoms were generally attended by diarrhœa, which, from the first, was more or less profuse. The discharges were at first of a light yellow, and strikingly resembled the light cherry yellow discharges that belong to typhoid fever in man. As the disease advanced, various modifications in the colour of the evacuations ensued. They became more or less of a dark green, and towards the end in many cases of a deep chocolate or dirty red colour, which tinge arose from the occurrence of hæmorrhage in the intestinal ulcerations. There was another symptom, and it is important in a disease like this, where investigations are new, to fix upon outward signs that may lead to early recognition. I do not know on what day, but apparently it was the second, third, or fourth day, the skin of the pig, between and around the ears, became of a red colour, passing into various shades of purple or violet. In the latter stages of the disorder there is another circumstance which appears to be more or less a characteristic of it. Many of these pigs became paralysed in their hinder extremities, and so weak as not to be able to stand. The evacuations became involuntary; the weakness gradually increased; and the animal sank. Such are the symptoms during life."

When dead, the only characteristic change in the body is the ulceration of the intestinal canal. The disease, it would appear, from all the information as yet obtained concerning it, is violently contagious, but peculiar to the pig. Instances have occurred where all the pigs in the farmyard were carried off, and yet no harm befell the men constantly working about, or to cattle going among them. For many years isolated cases of the disease appears to have been known to pig-dealers, but within the last two or three years it has changed its sporadic to an epidemic form; and Dr Budd states, on the authority of men who should be well-informed in the matter, that within the last eighteen months from ten to fifteen thousand pigs have died through this disorder in the south and south-west of England.

With a view to stop the ravages of this disease as much as possible, Dr Budd makes the following suggestions :—

First, Try to recognise the disorder in its earliest stages.

Second, Separate the sick from the uninfected without the least delay.

Third, And this is fundamental to my mind, because when once this disorder enters a farmyard it goes through all the swine in the place—immediately slaughter the affected animals.

Fourth, All these precautions will be in vain if you do not destroy the infectious discharge from the intestines of the diseased pigs.

You may separate the sick from the uninfected, but if in dry weather you turn your healthy pigs at the end of two or three weeks into the sty or the yard where the others had been ill, you will find the disorder break out anew.

Although we have not in Scotland suffered so much from this calamitous fever as pig-breeders in England, there have nevertheless, as Professor Gamgee pointed out, been many deaths; and all suggestions calculated to reduce the loss of animal food, now that beef and mutton are so high in price, should be carefully considered by farmers. If they should prove of value, their adoption, besides being profitable to agriculturists, will be a boon to the general public.

SALT FOR CATTLE.

A CORRESPONDENT, signing himself "H. P. B.," supplies the following to the *Albany Country Gentleman* :—

The price of salt having considerably advanced, with all other necessary articles, has led some farmers in the west to make the experiment of withholding salt altogether from their farm animals. The subject has led to considerable discussion in the papers in some quarters, whether salt is or is not really essential to the animal economy; some arguing that neither men nor animals can long exist and maintain any degree of tolerable health without the use of salt. On the other hand, it is asserted that in some parts of the world salt is used neither by the human race nor by dumb animals. In stating this latter proposition, if it could be proved that the deficiency is not made up indirectly in some other form in the food consumed, it might appear conclusive that salt is not essential to the health of animals. The farmers along the entire length of the south side of Long Island never have occasion to feed salt to their stock, and I presume it is the case over the whole width of the island, and yet all stock get a full supply. The winds from the sea sweep over the lands, loaded with saline particles, in the form of fine spray, which finds lodgment upon the herbage, and everything with which it comes in contact. During a severe storm I have seen it, seven miles from the ocean, lodge upon the windows, and when dry form visible crystals of salt. From this source the cattle and sheep obtain so large a supply of salt that they seldom or never manifest any disposition to seek it in any other form. It is asserted by those who have investigated the subject, that generally along the sea-coast for 100 or more miles in the interior, that analysis shows that soda is the prevailing alkali in the soil; while still farther in the interior, along the same range, potash prevails in the absence of soda. It is inferred that the soda is deposited by the winds from the ocean, loaded with salt spray.

It is stated that in Brazil, Uraguay, and the Argentine Confederation, where immense numbers of cattle, horses, and sheep are reared, that salt is never supplied to them by the farmers. I think that on investigation it would be found that nature has supplied salt, or its equivalent, through natural sources from the soil, rendering a supply in any other form unnecessary.

It is well known that blood contains a large percentage of salt, and salt is given off from the system through all of the excretory organs, the skin, kidneys, &c., in considerable quantities daily; hence the supply must be maintained or the animal must languish. Among some nations it is asserted that criminals are condemned to subsist without salt as a punishment for their crimes; the privation is represented as most tormenting.

In all Europe, from time immemorial salt has been largely supplied to domestic animals, and it is claimed by some of the most profound writers in those countries that animals cannot be maintained in a state of health without it.

In the Memoirs of the Royal Academy of Sciences at Paris, are several papers showing the great advantages of salt, both as a manure and for cattle. It is here asserted that salt given with the food of cattle augments its nourishment. That in proportion to the quantity of salt eaten by cattle, the effects of the augmentation are perceived. That no ill consequences follow its use when given without stint. It is said these propositions are supported by unquestionable evidence, and the trials of many persons.

Crau, in the jurisdiction of Arles, in the county of Provence, France, has an extent of six leagues by three, the whole surface of which is covered with small rough stones, and not a tree or bush to be seen upon the whole district, except a few scattered on the border, yet on this apparently barren spot, by the free use of salt, more numerous flocks of sheep are bred and reared than upon any other common of equal extent in the kingdom; and what is not less remarkable, the sheep are healthier, hardier, and endure the severity of the winter with less loss, though they have fewer sheep-cotes for covering than those bred in more luxuriant pastures, and that have the advantage of convenient shelter. Add to this that the wool of the flocks bred and brought up in the Crau is not only the finest, but bears the highest price of any in France. It is concluded that these surprising effects are consequent upon the unlimited use of salt.

It is further stated that it has been satisfactorily proved by trial in certain districts *in France, that* herds on the same farm have been separated into two lots, giving

one-half a full supply of salt, and giving none to the other half. In less than a month there is a marked difference in the appearance of the animals, in the sleekness of their coats, in their growth, and in their strength and firmness of labour; and these effects are produced with little more than half of the food consumed by the cattle to whom the salt is given.

In Spain, where the finest wool in the world is produced, large quantities of salt are given to the sheep, to which is attributed, in a great measure, the cause of the fineness of the wool.

In England a thousand sheep consume at the rate of a ton of salt annually. It is supposed to destroy the fasciola hepatica, or fluke worm. It is said that 1,000,000 tons of salt are given to animals in England annually, which would seem almost incredible.

Cato, 150 years before Christ, recommends salt for cattle, hay, straw, &c., as also does Virgil. In Germany and Spain it has been esteemed essential for sheep from the earliest history of those countries. In 1576, Conrad Heresbach commends it as being a certain prevention of the "murrain or rotte."

Independent of all the evidences that I have here cited, going to prove that salt is designed as an essential condiment, both for the human and brute creation, we have the unerring instinct of animals to show the demands of nature for this substance. In all parts of the world where salt mines or springs are found, there wild animals congregate, from hundreds of miles distant, to get a supply of salt. In our own country, the Big Bone Licks of Kentucky are noted for their having been the resort of all kinds of wild animals for the purpose of licking the water that issues from the salt springs of that locality. Numerous other licks in the various parts of the same state show similar evidences of their having been the resort of wild beasts. Deep-worn paths leading to the springs are even now, at this day, to be seen, where innumerable herds of buffalo rushed down the declivities in pursuit of salt.

FITS IN DOGS.

(*From the Scottish Farmer.*)

KENSINGTON, June 17, 1863.

SIR,—But yesternight I was the envied possessor of a little canine prodigy—a Skye terrier of such minute dimensions, of such an amiable and affectionate disposition, and of such intelligence and sagacity, that all hearts were charmed with him. I say nothing about his beauty, for besides that that is at all times a question of taste, it was a disputed point in our household whether he was good-looking or not—one party maintaining that he was the ugliest little creature ever seen, the other that he was the most beautiful, the truth perhaps being that his beauty consisted in his ugliness.

Punch has a cartoon, in which a sporting gentleman, with the peculiar flattened and bridgeless nose which poor Leech has taught us to accept as the type of the class with pugilistic propensities, exclaims, "I had ought to be a happy cove, for I've got a wife as can thrash any man of her weight, and I've got a child of two years and a 'arf as can eat two pounds o' beef-steak at a sitting, let alone owning the smallest black and tan tarrier in the world." Not valuing the two former possessions, their absence did not detract from the portion of happiness which, according to this authority, ought to have been my lot as the possessor of the minim which we called "Jip."

To-day I am desolate; both Jip and the happiness on him dependent have disappeared; and I wish to know from your skill whether there was anything in my conduct, in the "trying circumstances" under which I have lost him, which helped on the catastrophe, and whether I was guilty of sins of omission or commission—in a word, whether I have to thank myself or not for his loss.

As there are thousands upon thousands who are in my case of yesterday—that is, possessed of some cherished little pet of a dog just emerging from puppyhood; and not fewer who, at any time, may be in my case of to-day—that is, mourning its loss, I am sure you will not find your pains thrown away if you unmuzzle your wisdom, and impart to us some knowledge on the subject, even although to you and to a portion of your readers it may be a twice-told tale.

Jip was teething; his milk teeth were dropping out, and his permanent teeth coming in.

Jip had a fit, more of delirium than convulsions, about six weeks ago, and had never been quite himself since. He used regularly to come up to my bed-chamber in the morning; but latterly I have missed the patter of his little feet, and the whine for admission at the door. He became fond of lying dosing at the fire, although he always brightened up and became frantically happy at the prospect of being taken out. Still it was obvious that there was something the matter with him. I not unfrequently noticed, as he lay on the hearth-rug, that his hind leg and flank had a trifling twitch—not a convulsion, but something that way tending. As my little girl expressed it, "his hind leg had the hiccup."

A confused mixture of ideas, gathered from long-forgotten sources, about distemper, tape-worms, and teething convulsions, took possession of my mind, and I got out the castor-oil bottle and "administered" a dose. This was after the first fit, and I thought put him all right again; but only for a short time. I then gave him another; and a third only a couple of days ago. But I am bound to say that I believe the process of "administration," at least this time, did him more harm than the medicine did good; for Jip, being an intelligent dog, remembered the previous administrations, and it was only after a protracted struggle that the nauseous dose, or such portion of it as was not spilt, was at last—I shall not say emptied down his throat—but emptied out of the bottle.

Poor little fellow, he looked very shrunk and spiritless all yesterday and the day before, and was quite sensible that he was poorly when I took him up in my arms, and fondling him, said, "Are you not well, Jippy?" "Whimper," says Jip, in the lowest and most plaintive tone. "Have you got a headache, Jippy?" another plaintive whimper. It said as plainly as ever a dog spoke, "Yes, I am not well, and am very sorry for myself, and much obliged for your sympathy." It is difficult to refrain from dwelling on his many attractive ways; but I must get on with my tale.

Last night I took my hat and staff for an evening stroll, my custom always in the afternoon. Jip accompanied me, rejoicing in short effervescences of delight. We took our way to Kensington Gardens, and strolled along the round pond. Jip, of his own accord, paddled about a little in the shallow parts. The doing so seemed to impart fresh life and vigour to his little frame, and he distinguished himself by his romps and fun for a little while; but by and by all at once he turned over on his side, and was seized with violent convulsions, which gradually became fainter, until his eyes turned back in his head. I thought he was about to die, and taking him up, plunged him over head and ears in the water. The shock seemed to revive him, and a bystander prompting me to repeat the operation, I did so. I don't think that did him any good. When he revived from the first shock I wish I had at once carried him home. His mouth was now full of large bells of foam, not unlike what I have seen in a dog really mad; but he so far recovered as to be able to stagger into the water again by himself, into which he went until all but his head was covered. There he remained, breathing rapidly, and apparently very unsteady. I feared that the fit would return, and he would tumble over on his side, and waded in to lift him out; but he growled and snapped most viciously as I approached, and backed into deeper water, and presently turning round, swam away for the centre. He soon turned, however, and as I came back to shore he resumed his place within his depth, but covered up to the neck. All efforts to entice him out were vain. His eyes had wholly changed their appearance; even their very colour was not the same. He obviously did not know me. All my cheepings, my "good dog's," and "come, Jippy's," were thrown away, and any attempts to get hold of him were met by fierce growling and vicious snapping, and if persisted in, by his backing into deeper water.

Meantime the night drew on; the circle of sympathising spectators which had at first honoured me with their countenance and support had gradually diminished until I was left alone. The keeper's cry of "all come out," had ceased to resound through the trees, and one of them came up to warn me that I must leave, as the gates would be immediately locked. He kindly waited a quarter of an hour, joining his efforts to mine to induce the little animal to come out; but at last there was no alternative —go I must. To the last I bent my eyes on Jip. There he stuck; and the last view I had of him was his little black head just visible above the water on the far side of the pond.

Of course all sorts of injunctions were given to the keepers to look out for him the first thing this morning, and to make sure, I was there early myself; but as yet no trace has been found of him. For my part, I expected to see his little body floating on the surface of the pond, or lying at its bottom. This has not been realised. He *must have come* out, and if recovered, has wandered away, or been picked up by some

"dog-finder." If not recovered, he may have crept into some out-of-the-way corner to die, where his dead body may not be found until we "nose it" as we go up the nearest walk.

Will you favour us with your remarks upon this case, and your advice to others who may be similarly circumstanced.

I should add, that with every desire to confine this dog to a vegetable diet, we have found it impossible to do so without absolutely starving the beast. It was sent up to me from Scotland in the steamboat, and I am apt to suppose that it acquired, on the short voyage, a predilection for meat; at any rate, it would eat nothing here but meat, except under the strongest pressure. I am ashamed to think of the quantity of good porridge and bread that has been wasted in trying to keep it upon a vegetable diet.—I am, &c., M.

[Jip is a victim of one of those nervous diseases incident to puppyhood. Tape and other worms, as our correspondent evidently understands, are common causes of convulsions in dogs; but though young dogs are especially obnoxious to these, so careful an observer as "M" would assuredly have noticed his puppy was passing worms, or drawing itself along the ground with its fore-limbs, had these been present in any number. Teething and costiveness will each at times produce fits in the puppy, and from the description given, it seems highly probable that in the instance before us they were partly due to both of these causes. We are perpetually having brought to us favourite dogs suffering from over-feeding, costiveness, and one or other of a variety of disorders thereon depending, and in many cases the best treatment is a little wholesome starvation and moderate exercise. Jip appears to have been living on the most nourishing and stimulating diet, and has been by no means over-exercised, conditions which, in such animals, so constantly result in digestive derangement and nervous affections. Add to this the vascular excitement about the head, and the nervous irritability attendant on the irruption of the permanent teeth, and in our opinion there is reason enough for the convulsions. The twitching of the hind-leg—*St Vitus' dance*—was due, in all probability, to some structural change in the nervous centres consequent on the earlier fit, and the same change would furnish a strong predisposition to the accession of the later ones.

A vegetable diet is no doubt unnatural to the dog, but in the case of a favourite everything is artificial, and it is generally found that restriction, in part at least, to a vegetable diet is more conducive to health. With a little wholesome constraint, this can usually be effected, though, if fed several times a day, and especially if allowed to share with his master in his regular meals, it may be acknowledged impossible. By attention to this, to giving a moderate amount of exercise in the open air, and by observing that the various functions, and particularly those of the digestive organs, were kept in an active condition, the fits might possibly have been averted, and the favourite saved.

When a fit has come on, we have seen good effects from the application of cold water to the head, and the administration of a diffusible stimulant, such as two teaspoonfuls of sulphuric ether in a glass of water as an injection. Even after coming out of the fit, the rapid breathing interferes for sometime with the administration of anything by the mouth. It is well, too, to secure the dog, by a cord round the neck or otherwise, from running away and getting lost, as Jip unfortunately was. The after-treatment should consist of a dose of physic, a spare diet, principally vegetable, and regular exercise, during which he may be led with a chain, to avoid all causes of excitement. Dogs in this condition, that may have been free from fits for a length of time, very often have an attack from the sudden joy and excitement on again meeting their master. With care they will often recover, though it may be necessary after a time to give a course of *quinia* or other vegetable tonic, or even to employ *strychnia* or *nitrate of silver* to counteract any remaining functional derangement of the nervous system.]—Ed.

THE NEW VETERINARY COLLEGE.

(*From the Scottish Farmer.*)

It is now formally announced that a company has been formed to transfer to London the New Veterinary College of Edinburgh. From all we can learn, it is upwards of two years since Professor Gamgee was solicited to remove to London. With a sure position here, and a college of his own foundation rapidly rising in public favour, he

did not feel disposed to listen to the request; and it has been only after protracted negotiations, and the offer of terms that could not well be refused, that Professor Gamgee has agreed to remove southwards with his staff of teachers, and all that can be transplanted, for a college in Belgravia.

Two causes seem to have especially influenced the movement: the first was the want of an infirmary of the highest class for the west end of London, where it is natural to suppose that hundreds of animals will speedily throng such a place in a wide district where the houses of the wealthy are increasing in number with marvellous rapidity. The second cause has been the reputation acquired by the Principal of the New Veterinary College as a teacher of his profession. The medical world of London has long been alive to the fact, that within the walls of the New Veterinary College the science of comparative pathology was acquiring a development such as it had failed to attain elsewhere, and the active influence of the medical profession first led to the proposal made to Mr Gamgee.

We are in a position to state that no one connected with the New Veterinary College ever sought or encouraged, directly or indirectly, any such proposals; and until very recently it was believed that the transfer could not be secured. Now that arrangements seem to be attaining maturity, we have no hesitation in declaring that one of the most useful institutions of this city is passing from us. Established against the violent opposition of a strong party, it has gained ground, and attracted attention to matters of great moment in relation to public health, notwithstanding the systematic attempts made by various parties to smother discussion on that most unpleasant topic, the traffic in diseased animals.

The Directors of the Highland and Agricultural Society, the old Veterinary Colleges of England and Scotland, and many influential individuals, combined at first to put down the new institution. It struggled manfully, and defeated them all, until at last the attention bestowed by Government on Professor Gamgee's researches gave the New Veterinary College a status such as no similar institution has perhaps ever held in this country. The manner in which the small-pox outbreak was arrested in Wiltshire, the publication of an official report on the diseases of animals in relation to the supply of human food, and the inauguration at Hamburg of the first International Congress of European Veterinarians, have contributed much to strengthen Professor Gamgee's reputation. No one can deny that the battles he has fought, at first against fearful odds, have been won. Edinburgh citizens know this, and are grateful to him for it. There are those who speak of the present transfer as an indication of the decline and fall of the New College. We are usually inclined to look on a removal from Edinburgh to London in the light of promotion, and not of retrogression; and the rumours set afloat by the party inimical to Professor Gamgee, and especially by the London Veterinary College, have no foundation in truth. When we consider the manner in which large sums have been spent in encouraging young men to work long and hard at their profession, the labour and the outlay devoted to the improvement of our veterinary literature, the liberality with which museums, libraries, &c., for students have been formed and enlarged, it is not a little surprising that, unaided by Government and agricultural societies, the New Veterinary College should have held its ground, and year by year taken deeper and deeper root. We are not astonished that the London College should dread such a rival as the New Veterinary College, though we must confess there is room for surprise at the attitude assumed by the Professors who edit the *Veterinarian*, the tone of the article which appeared in the last number being, to say the least, unmanly, and scarcely to be expected from gentlemen following a liberal profession. Such attacks can recoil only on the authors; and we can inform them, that had the New College "come to grief," as they insinuate, there are hundreds of public-spirited men in Scotland who would have averted the disaster, and saved from such a calamity so excellent an institution.

EXCHEQUER COURT.—WEDNESDAY, MAY 31.

TAYLOR *v.* HARMAR.

[Before Mr Baron PIGOTT and a Common Jury.]

THIS was an action brought to recover the sum of £19 on the warranty of a horse.

Mr Karslake, Q.C., and Mr T. Salter, were for the plaintiff.

Mr Hawkins, Q.C., and Mr. Wills, were for the defendant.

The short facts, as abridged from counsel's opening statement, were—the plaintiff

was the owner of the Deep Carr Mills and Moorside Farm, a few miles from Sheffield. That, wanting a cart horse, he sent his general managing man to a neighbouring fair, in January last, to purchase such an animal as he required. On arriving at the fair, Messrs Dyson and Brier (the parties sent) saw the horse in question, the property of Mr Harmar, who asked the sum of £40. Dyson examined the animal, and found a lump behind one of the ears, which he thought was the "poll evil." He inquired of Harmer about it, who assuring him it was not so, and that he was ready to give a written warranty, Mr Dyson effected the purchase for the plaintiff on the condition of £1 off. The horse was taken to the farm and in due course lightly worked, when it was found he hung his head, and gave all the signs of poll evil. A correspondence ensued between the parties; the defendant declined receiving the animal back on the ground alleged, asserting there was no disease of the kind; and hence the present action for the difference, the plaintiff having sold the horse for £21.

Mr Wm. Brier, sworn and examined, deposed he resided near Deep Carr, and was the manager of the Deep Carr Mills. That on the 25th of January was at a fair at Chesterfield, and saw a bay horse of Mr Harmar's in the Market Place. Witness liked the horse, and asked Harmar whether he would warrant him sound. He said he would to him, but not to a dealer. The price was 40 guineas. Dyson examined the horse and said, "There was a lump on the off side of the head." Harmar said he would warrant him sound; and he gave a written warranty and £1 off. They then had a glass or two, and witness went home by the railway, and the horse was taken to Deep Carr. Got home that night, and the next morning saw the horse at the Mills. Shortly after, the man in charge of him said he hung his head, and he did not like the appearance of the animal. Witness saw him in the yard, the horse was examined by Dyson, and there was a lump on the off side of the head. Called upon Mr Turner, a veterinary surgeon of Sheffield, the following day, the 22d of February, and it was pronounced to be the poll evil. Mr Harmar came with another gentleman to look at the animal at Deep Carr.

Mr. Hawkins: It may save some trouble if I mention the gentleman's name was Martin, and he is a veterinary surgeon.

Examination continued: They said he might have hurt his head by the baulk in the stable, or been beaten over the head. The horse was ultimately sold, as they did not choose to apply iodine or other expensive or long remedies.

In cross-examination by Mr Hawkins, witness said: The plaintiff is an attorney. There was an offer made by Mr Cutts to refer the whole matter to a veterinary surgeon. Mr Taylor told him that was so.

Baron Pigott here inquired if the question was, whether the horse had the poll evil?

Mr Hawkins: Yes; that is the question.

Baron Pigott: I should have thought a veterinary surgeon as well able to decide the question as a jury or I.

Mr Hawkins: And I will leave it to any competent veterinary surgeon. The horse is here, and they may go and look at him.

Baron Pigott: Have any of you gentlemen (to the jury) ever seen a horse with poll evil?

Several jurymen here said, "No."

Baron Pigott: And I never saw but one.

Mr Karslake declined to accede to the proposition to refer, as he did not know what had been done to the animal since it was out of their power.

Cross-examination continued: Did not know much about poll disease, except that it was an abscess that produced it. Did not examine him as Mr Harmar said he would warrant him sound. Left it to Mr Dyson to examine him. The man in charge of him said he would shy when he came near him. Harmar said he had probably been beaten about the head. The man denied he had ill-treated him. Applied his finger to the lump, it was a small lump, and the horse winced a little when he pressed it. Did not find any heat in it.

On re-examination nothing particular transpired, and the Court then adjourned until ten o'clock the next morning.

THURSDAY, JUNE 1.

George Dyson, examined by Mr Salter, said he was a farmer, living at Thurgelay. On the 25th January he was at Chesterfield with Mr Brier. While he was with Mr Brier and Mr Harmar in the yard of the Angel Inn, he saw a bay horse. He observed a lump on the top of his head, and called Mr Brier's attention to it. Mr

Harman said he would warrant the horse all right and sound; upon that Mr Brier purchased the horse. Early in March he saw the horse at Moorside. The lump on the head still remained. It was about the same size as before.

Cross-examined by Mr Wills: On the 5th of March he did not look at the horse's mouth, and could not say whether it was sore. He had not said to the defendant when Mr Brier was buying the horse, "Why, here is a lump." He did not think much of it.

John Ray, examined by Mr Karslake, Q.C.: Lived at Moorside, and was a farm servant. He fetched the horse from Deep Carr Mills to Moorside, and put him in a loose box at Moorside. The weather being stormy, the horse was not washed till a fortnight and a day after, when it was taken along with two others to Deep Carr Mills. He observed that the horse held his nose out and his head on one side going and coming back. When he returned home, and was put into the loose box, he did not eat very well. Since that the horse had been taken out, and had conducted himself in the same manner. The horse getting worse, Mr Turner came and examined it, and gave instructions that the horse was not to be washed.

Cross-examined by Mr Wills: He had never struck the horse. When the horse was in the loose box he had no halter. The harness that was used had previously belonged to a larger horse.

Thomas Stevenson, a corn miller, living at Moorside, was present when Mr Harmar and Mr Martin examined the horse. They each took hold of the horse by an ear and examined the head. Mr Martin gave Mr Harmar a nudge, and they afterwards cross-examined Paddock, a man who was in the stable, with respect to the horse in all shapes and forms.

Cross-examined by Mr Wills: He supplied Mr Taylor with corn. He did not hear Paddock say that a man had struck the horse. Mr Martin said several times, "Oh, he has been struck with a fork;" but the man said he did not know anything about it.

Septimus Edward Turner, examined by Mr Karslake, said that he was a veterinary surgeon living at Sheffield. He had examined the horse upon the request of Mr Brier at Deep Carr Mills. He found an enlargement on the off side of the head, the seat of the poll evil. The poll evil is an enlargement of the head. If a horse was washed while it had the poll evil, it would probably kill him. Subsequently he saw the horse again, when the horse presented the same symptoms; he also examined the stable, and he did not believe from the appearance the stable presented that the horse could have struck himself, and so caused the injury.

Cross-examined by Mr Wills: If a horse was washed while it had the poll evil, it would not be proper treatment. You can tell afterwards by examination whether a horse has had the poll evil or not.

Charles Taylor, examined by Mr Karslake: A veterinary surgeon of Nottingham, confirmed the evidence of the previous witness, and also stated that poll evil was most frequently caused by external injury.

Mr Wills, in opening the case for the defendant, stated that he would be able to prove that at the time this horse was sold it was in a perfectly sound and healthy state. The jury would have positive evidence laid before them from the most eminent veterinary surgeons, that so far from this horse having suffered from poll evil, it never had had the poll evil at all. The learned counsel believed that even the plaintiff's witnesses had failed to make out a case against his client; but in order that no doubt might remain on their minds, he would place before them the most reliable evidence as to his state before and after the sale; and he should then ask them for a verdict for Mr Harmar.

Mr Wm. Harmer, examined by Mr Wells: A farmer, living at Calow, near Chesterfield, said that he was defendant in the action, and had worked the colt that was the subject of the action from the time he was about a year and a half old till he was sold. There was nothing the matter with him when he was sold. It was not true that Mr Dyson had called his attention to a swelling at the back of the horse's head —it was perfect untruth. He received a letter on the 25th February stating that the horse was not quite right. The 25th February was on a Saturday; and on the next day he and Mr Martin went over to Moorside farm to see the horse. When he got there he went straight to the horse's head because his attention had been called to that by the letter. He did not nudge Mr Martin, nor did Mr Martin observe that the lump was no bigger. He could not swear that there was any enlargement on the head at all. There was a good deal of hair on the horse, and the hair was all ruffled up. It appeared as though it had been pushed by the fingers into a tuft; but as to

any enlargement, he could not see any difference on the one side from the other. The first thing that he noticed was his mouth, which made him observe to Mr Martin that if he had not got the poll evil he had been punished sufficiently to have had it. The mouth was raw on the top, and there were symptoms left of it then. The man in the stable said that the fellows who worked with him had thrashed the horse with a fork shaft. On the 10th March the horse was sold by auction, and a friend of his bought the horse by his direction, and it was removed to the defendant's farm. The horse had never been attended to since the sale, and had been set to work immediately he reached the farm.

Cross-examined: He never asked any questions of Mr Martin respecting the horse before he was set to work, but after that Mr Martin examined him, the horse worked at general farm work.

James Martin, veterinary surgeon, Chesterfield, stated he had seen the horse the day before the sale, and upon examination he found the horse perfectly sound. There was nothing the matter with the head, knowing very well what cart-horses were subject to. About a month after he again examined the horse and found the mouth very raw on each side. There might have been a little irritation of the skin on the top of the head, but it was scarcely perceptible. Mr Harmar said that he had received a letter respecting the horse in which poll evil was mentioned, and the witness took particular care to examine the horse with regard to that, but there was not the slightest symptom of poll evil.

Cross-examined by Mr Karslake, Q.C.: There was a little rubbing of the hair on the top of the horse's head, that was all.

—— Whittaker, a labourer in the employment of Mr Hamar, said that he had had the care of the horse up to within a fortnight of the time of the sale. He had taken the horse to the sale, and the horse was perfectly sound. He saw the horse after it came back from the second sale, and it had been put to work at once, and since that time had been worked regularly.

Cross-examined: There is not a better horse for work on the farm. The horse holds his head up particularly high. He is a good honest horse. The witness ceased to take care of the horse a fortnight before the sale, because he had left Mr Harmar's employment.

Mr Herbert Johnson, examined, said that he was a dealer in horses, and had seen the horse the day before the sale. He was taken with the horse, and offered £36 for him.

John Meakin, examined, stated that he was a dealer in horses, and had seen the colt the day before the Chesterfield fair. He also had made a bid of £36.

Cross-examined: He saw the horse at Mr Harmar's house.

Mr John Johnson said that he was a dealer in horses, and had known the colt ever since it was a foal. The day before the sale he had examined the colt. He had examined the head particularly, and there certainly were not any symptoms of poll evil.

Charles Bean, examined: Was in Mr Harmar's employ a fortnight before the sale of the horse. Whittaker took the horse to the fair, and witness attended to the other horses. Up to the time he parted with him there was nothing the matter with the horse. He came back to the farm early in March, and since that time had been worked regularly.

Cross-examined: He has worked harder than the other two horses. He was bigger and stronger, and so they gave him more to do.

Mr Henry Rangeley, examined, deposed that he was a colliery proprietor, and also a manufacturer of pig iron. He had given twenty guineas for the colt.

Mr R. Reynolds stated that he was a veterinary surgeon, and had examined the horse, and found no symptom of poll evil. He would not have the slightest difficulty in discovering whether the horse had ever suffered from that disease.

Mr Mavor and Professor Spooner of the Veterinary College, London, also gave evidence, strongly confirming the evidence of Mr Reynolds.

Mr Baron Pigott, in summing up the case to the jury, said the only question was whether the horse was sound on the 26th of January, when it was sold to the plaintiff. It was admitted that the horse was warranted, and therefore no question could arise upon that. If they believed the evidence of the surgeons who had been called for the defendants, and had stated that no symptom of poll evil could be discovered, they would probably think that the horse had received a blow after the sale, and that it was perfectly sound when sold by defendant. If so, they must return a verdict for the defendant.

The jury immediately returned a verdict for the defendant.

ON STOCKING LAND.

BY THE REV. J. L. BRERETON.

(*From Journal of Royal Agricultural Society of England.*)

MY DEAR MR FRERE,—In complying with your request that I would send you some account of my farm, I must ask you to make allowance for the unprofessional character of my statement. It is, however, to the best of my knowledge, correct; and the valuations have been revised and approved by men of experience and repute as practical farmers. Though I do not profess to be an adept in the art of farming, I have for some years followed it as a pursuit of mnch interest; and if I have not realised a profit equivalent to the cost and trouble bestowed, I think I have learnt some of the conditions under which farming in England may be hopefully carried on, as not only a pleasant but a remunerative occupation. An opinion seems now to be rapidly spreading through England, that the plants which the farmer grows will not yield him so much profit as the animals he feeds. Whilst free trade and cheapened transport have greatly affected the value of corn, animal productions—such as fresh meat, milk, butter, and wool—command a sale that justifies the use of even the more costly grain in providing them. The moist climate of North Devon had led me for some years to anticipate this opinion, and to think that my neighbours were wrong in making corn the principal object of their industrious efforts; a gradual impoverishment of themselves and their land seemed to me too probable a result from persisting in their system. I was aware how much, in my native county of Norfolk, under the four-course system, the growth of corn had been increased by interposing a large growth of food for stock, and how this multiplication of the stock had been still further promoted by the purchase of food grown elsewhere, especially oil-cake. But I believed that the time was coming when, even in Norfolk, the stock would be found to be most remunerative, and that, consequently, the farmer would only grow corn so far as it harmonises with the profitable keeping of stock. Under such management much valuable manure would be made, which would indefinitely increase the productive powers of the land; and (unless prices changed) the increased production, whether ripened into straw or used in a green state, would still further increase the amount of the stock reared or fed. But under these circumstances a total change would take place in the relations of capital and land. Hitherto the question has been, How many acres can be most profitably cultivated by a limited capital? Henceforth it will rather be, How much capital can be profitably expended on a limited area?

I have no doubt that these and similar questions have suggested themselves to you and many others. For myself, they have guided my course for the last few years, and have led to the following result, which, if you think it of any value, you are very welcome to publish.

My glebe consists of about thirty acres of grass-land, which used to let at a rent of £55. I have farmed it for some years in connexion with various parcels of land which I have temporarily rented in the neighbourhood. The general result has been, that from keeping an extra quantity of stock, and particularly from folding sheep with corn upon my grass, its value has been considerably increased. It would be perhaps a fair account of previous improvement to value its gross rent for the present year at about £3 per acre, or £100. In order to make myself as free as possible of tillage farming, I have for some time used sea-sand instead of straw as bedding for cattle. I have also used a compound meal (the ingredients of which I subjoin) as the principal accessory to the grass and hay. The turnips I have purchased were all used for the sheep; none for the bullocks and horses. The oats and straw bought were for the stables. My practice has been to charge the whole cost (including labour) of the stables to the farm, and to credit the farm with 12s. per week for every horse used for riding or carriage. In order to increase my hay-crop, I hired some other grass-land, the rent for which is included in the charge for fodder.

Statement of Farm Accounts on the Glebe, West Buckland, from October 1, 1863, *to October* 1, 1864.

A. COST OF STOCK.

By Valuation October 1863:—

	Bullocks.	
2 Kerry cows in calf	£16 0 0	
4 Devons	40 0 0	
3 Yearlings	19 10 0	
1 Calf	3 0 0	
Carry forward,		£78 10 0

Brought forward,		£78 10 0	
Horses.			
2 Brood-mares	£62 0 0		
2 Cobs, 4 and 5 years	66 0 0		
2 Carriage-ponies	40 0 0		
1 4-year-old filly	25 0 0		
3 3-year-old fillies	76 0 0		
2 2-year-old (colt and filly)	30 0 0		
2 Yearling colts	20 0 0		
5 Sundry ponies	37 0 0		
		350 0 0	
Sheep.			
45 Ewes, at 59s.	£132 15 0		
32 Old ewes, at 50s.	80 0 0		
41 Ewe-lambs, at 35s.	71 15 0		
40 Ram-lambs, at 60s.	120 0 0		
3 Rams, at 100s.	15 0 0		
		419 10 0	
			£848 0 0
By Purchase during the year:—			
Bullocks.			
7 Dairy cows and 4 calves		£113 2 6	
Horses.			
1 Pony		12 0 0	
Sheep.			
4 Kentish ewes, at 40s.			
77 Devon Nott. ewes, at 49s.			
80 " 50s.			
30 " 57s.			
1 Cotswold ram, at £25.			
1 Lincoln " 25.			
1 " " hired £30.			
Journeys and expenses for rams £12		574 3 0	
			699 5 6
			£1547 5 6

B. Expenditure during the Year.

Rent and taxes		£100 0 0	
Labour		251 6 10	
Manures:—			
Sea-sand for bedding	£57 17 11		
Other manures	26 16 0		
		84 13 11	
Purchased Food:—			
Hay by valuation, Oct. 1863	£90 0 0		
Cattle-food	300 0 0		
Roots	100 0 0		
Straw, oats, and hired keep	167 4 7		
		657 4 7	
Tradesmen's bills		36 6 9	
		£1129 12 1	
Hay and turnips in stock, Oct. 1st, 1864, by valuation		305 0 0	
			824 12 1
			£2371 17 7

C. Sales and Valuation.

Sales:—	*Bullocks.*			
4 Bullocks and 1 calf . .	£77 17 6			
Milk at 11d. per gallon . .	140 1 0			
		£217 18 6		
	Horses.			
Brood-mare and 2 cobs . .	£130 0 0			
2 Ponies	17 0 0			
Keep of 3 stable-horses, at 12s. per week	96 12 0			
		243 12 0		
	Sheep.			
31 Rams by auction . . .	£184 17 6			
64 Draft ewes	149 19 6			
Sheep killed for the house . .	21 3 0			
		356 0 0		
			£817 10 6	
Valuation:—	*Bullocks.*			
12 Cows, 1 yearling and 4 calves . . .		£193 16 0		
	Horses.			
1 Brood-mare	£25			
2 Carriage-ponies	30			
1 5-year-old mare	35			
3 4-year-old mares	150			
2 3-year old "	50			
3 2-year-old "	40			
4 sundry ponies	47			
		377 0 0		
	Sheep.			
210 Ewes, at 63s.				
21 Fat sheep, at 50s.				
37 Ewe lambs, at 45s.				
32 Ram " at 80s.				
1 Cotswold ram, £25.				
1 Lincoln " £25.				
4 "New Devon" rams, £20.				
Wool £150.				
		1144 15 0		
			1715 11 0	
			£2533 1 6	
Farm—Creditor			£2533 1 6	
" —Debtor			2371 17 7	
Balance			£161 3 11	

Showing a profit of £161, 3s. 11d., in addition to the manure, which is valued at "not less than £200."

I am aware that the above statement is open to many challenges; but being an accurate account of transactions recorded and classified for my own satisfaction, and not for publication, it may perhaps be the most suggestive form in which to put before your readers the gross result of farming on the principle of purchasing corn, &c., to feed stock. I will add a few explanations in anticipation of some of the queries that may be raised.

The Valuations.—The first of these was made by myself and my bailiff towards the end of 1863. It was afterwards revised, item by item, by the late Mr George Burden of Kerscott, who was esteemed as one of the best farmers, and I must add, in memory of his recent death, one of the best *men* in North Devon. The second valuation was made by Mr Mortimore of Warkleigh, whose judgment and experience both as a farmer and valuer are recognised with great confidence throughout the *district.* The standard of the two valuations is not, I believe, very different. I

mean that the excess of the later valuation is not to be attributed to any exceptional rise in prices, but to the increased value of the animals themselves, owing, in the sheep, to careful drafting, and, in horses, sheep, and bullocks, to the growth of young stock, and to their generally improved condition, in consequence of the liberal expenditure on food and attendance.

The Labour.—This item will appear less exceptionally high if viewed in reference to the capital rather than the acreage with which it is connected. It represents the whole expense of supervision, attendance on the stock, cartage of manure, haymaking, &c. I have, it is true, paid higher wages than the neighbourhood, but have, I think, had a proportionate return of cheerful work. In attendance upon stock, it is of course possible to reduce the cost of labour very much by organisation and regularity. In this I acknowlege that I see how very great improvement might be made on my farm; but I have been much occupied in other matters myself, and the importance of these things is not always perceived, and very seldom enforced by subordinates. It is the coachman only who is likely to see that all the harness is adjusted to the team. The uninterrupted attention required to ensure economy either in a small or large farm, is generally the secret of the real farmer's success and the amateur's failures; in my own case, if I do not quite acknowledge failure, I can see daily that my affairs might have been much more economically managed; but my only means of controlling waste has been a steady adherence to certain principles. I have thought that the true economy of labour was to be found, not in lower wages, but in a higher quality of workmen.

The following analysis of my labour-bills may give some explanation of the amount incurred:—

Weekly labour,	Stables, (approximately,)	£36	£163 15 11
	Sheep,	32	
	Bullocks,	32	
	Steam-engine, hay and manure,	64	
Supervision,			40 0 0
Horse labour, (hired,)			43 12 9

Sand.—Passing to the next item of expenditure, the principal manure purchased has been sea-sand. This has been used as bedding for bullocks, horses, and sheep, instead of straw. It cost me 6s. 8d. per ton, as I have to draw it eight miles. Speaking roughly, I think that, for bedding purposes, the ton of sand goes as far as the ton of straw, while the latter costs me 30s. per ton. Except in the stables, I do not like to see any straw used for litter, though it has not been easy to break through the feeling of the attendants that the comfort of the animals required its use. The economy, however, of converting straw into food instead of litter seems so great, that I have persevered in the use of the sand; and I think my bailiff and men would generally now give it the preference. The effect of the manure has been very striking: in the last very dry summer, 22 acres yielded fully 45 tons of hay; the quick action of the sand manure has been noticed much by the neighbouring farmers; it has also been found that the sheep can be pastured upon the ground very much sooner after the sand than after straw manure. This distinction may depend upon the salt which it contains. The remarkable healthiness of my stock, in spite of the number kept to the acre, may perhaps be attributed to the free use of this sand, though something is due to the high situation on the borders of Exmoor, and much to the healthy action of the slaty subsoil.

Quantity of Stock to the Acre.—The balance-sheet does not of itself explain the number of stock kept on the 30 acres, because it does not give the dates of all the purchases, or the quantity of extra land, the temporary hire of which is included in the general charge for purchased food. But I think I can say with certainty that the average number of sheep kept during the year upon the 30 acres has been 150. For a few weeks there were less than this number, in order to favour the hay-crop; but after the hay season there were, for some weeks, as many as 300 on the glebe.

As a general rule, the ewes have a range of about 6 acres to 80 head. During the winter they have chaff, turnips, and a little meal. The present allowance (the highest in the year) is, for 80 ewes on the glebe—

	s.	d.	
½ lb. of meal each, at 1½d.	4	2	a day.
⅓ ton of roots, 14 lbs. a-piece, at 12s.,	6	0	„
90 lbs of chaff, (¾ hay, at £4, 10s., ¼ straw, at 30s.,)	3	0	„
	13	2	or 2d. a day for each ewe.

Another lot of ewes in better condition, and having a better range of pasture, are receiving only ½ lb. and 5 lbs. of roots, without any chaff. During the summer months the ewes graze in large folds, frequently changed, so as to allow the grass to freshen behind them. According to the weather, they will lie in the same plot from six days to three weeks. My own judgment is, that by constantly interchanging the fold and the scythe, the necessary range, even of breeding-ewes, may be very much lessened. In wet weather, we have trouble with their feet if they are allowed to tread the ground overmuch. But I am gradually forming yards to be asphalted, in which I propose to have them always fed in very wet weather, allowing them the open pasture at other times. I think the scythe or mowing-machine should be constantly at work; during the past year I was cutting grass with the machine from the beginning of May to the middle of November. In the spring and autumn the mown grass has been further cut into chaff, with straw for the bullocks and horses; but the sheep have had it carried to their troughs fresh cut.

The 70 lambs were with their mothers to the beginning of June; I then hired a piece of clover for them for one month. On the first of July they came back to the glebe, and have ever since been upon it in two pens, 38 ewes and 32 rams. Since the first of July, the ewe lambs have been over about 10 acres of ground, in part twice, (the scythe intervening,) in folds of ⅛ to ¼ of an acre: the ram lambs have been kept rather closer. The ewe lambs had about ¼lb. of meal each from June to October, then ⅓lb., and since Christmas ½lb., the maximum allowed to ewes. The rams began with the same quantity, but were pushed forward more quickly, and from October to the present time have been getting rather more than 1 lb. each. On the day I write, (January 21,) I have ascertained that the following are the actual allowances:—

32 ram hogs:—	s.	d.	
5 cwts. of roots, at 12s.	3	0	a day.
36 lbs. meal, at 1¼d.	3	9	"
15 lbs. chaff	0	6	"
	7	3	or 2¾d. per sheep a day.

37 ewe hogs:—	s.	d.	
5 cwts. of roots	3	0	a day.
18 lbs. meal	1	10½	"
15 lbs. chaff	0	6	"
	5	4½	or 1¾d. per sheep a day.

Attendance on—
80 ewes.
32 ram hogs.
37 ewe hogs.
—
149 sheep. One man's wages, 12s. a week, or 1d. a week per sheep.

These allowances represent the highest cost of keep during the year; and I find that they correspond very nearly with the allowance at the corresponding period of last year. The bullocks are having 10 lbs. of the mixed food, and the horses 4 lbs., with hay and straw chaff, but no roots.

The following memorandum of the consumption of food on the 14th of October will represent very nearly the average consumption of meal in the year:—

	lbs.
20 fatting ewes	28
32 ram lambs	36
38 ewe lambs	12
6 bullocks	60
2 ditto	9
5 horses	20
	—165

Milk.—The charge for milk, 11d. per gallon, is I am told higher than the average price of new milk. I have found that in buying or selling new milk in small quantities in this village, the price has been generally 3d. a quart; but as the greater part was used or converted into butter in my own family, and the skim-milk consumed by lambs, colts, &c., was charged to the farm at 3d. a gallon, the price of 11d. *may perhaps* be higher than the average, and so represent on my balance sheet an *unreasonable* profit. But if so, it explains itself.

The cows have generally been bought fresh-calved, and milked so long as their milk seemed to pay for their food, and then fatted. We have thought that, fed upon meal, they lay on more fat while milking than when fed on roots. In one case I fatted a cow and some sheep on meal and water alone, but without very accurately noting the comparative cost. The cow, however, was considered to have done remarkably well, and the beef was unusually juicy. Her allowance was 12 lbs. of food, with water *ad libitum*. I mean to repeat this experiment, and have ordered two cows just dry to be put on the same allowance; their cost would be 15d. per day, besides attendance. My bailiff thinks they require a small quantity of chaff in addition to the meal, in order to assist them in raising the cud; but not for the sake of bulk, which is sufficiently supplied by water—as nutriment is by the various ingredients of the meal.

Roots.—The turnips purchased during the year have cost about 12s. 6d. per ton, and about 150 tons have been consumed on the glebe. This quantity had been thought by my bailiff necessary both for the ewes, and more especially for the rams he was preparing for sale, but I think that the same money expended in meal would have gone further: I have not, however, wished to depart too abruptly from the track of experience; though it is clear that the circumstances of the case are so altered by the relative cheapness of corn and dearness of cattle that the cautious observers of precedents may be more likely to mislead than the more adventurous.

Thus much I think I can assert as to the result of some persevering experiments in the new direction:—

1. That it is quite possible to feed animals on purchased food alone.
2. That a mixture of the common grains and pulse,—*e.g.*, linseed, pease, beans, wheat, &c., may be made for £10 per ton, which will fatten any animal.
3. That the addition of seasoning (aniseed and fenugreek are those that I have used for five years) at an additional cost of £1 per ton, appears to pay well in the added relish and the improved condition of the animals.
4. That doubling the quantity of linseed, though raising the price, probably gives quite a proportionate increase to the value of the mixture.
5. That by the use of this meal the farmer may fearlessly increase his stock without adding to his acres; and yet, by that increase of stock, must greatly increase the productiveness of his farm. This consideration both suggested and replied to the following exclamation of a neighbouring farmer: "Mr Brereton, if you 'm doing all this on 30 acres, I 'm thinking what 's to become of the landlords."
6. That the use of sea-sand as bedding will enable the farmer either to dispense with straw, or to use it more profitably as food; and that besides possessing, according to its quality, manurial properties, the sand acts as a purifier of the land, and seems to allow of a closer herding of stock than might be otherwise safe.
7. That sheep may be folded on grass with great advantage, if some shelter and dry treading is provided in adjacent yards during excessively wet weather; but the bullocks and horses do best in yards and sheds, the grass grown after the fold being cut by the scythe and carried to them.

The success of such stock-farming as I have advocated must evidently turn upon the acquirement of good judgment in the selection of stock—a faculty which will henceforth assume increased importance in the training of the young farmer. I should like therefore to append to this statement a few words on the subject of agricultural education, in which you know I am much interested. Without for one moment wishing to decide the question, *adhuc sub judice*, of the advantage of combining special learning with general—of preparing a boy at once for the duties of manhood and for those of his own calling—I cannot help protesting against the summary manner in which this question is sometimes disposed of. On the one hand we have men of high authority pronouncing it as a dictum, if not an axiom, that only general education can be given by teachers in public institutions; but that special education (except in the case of the learned professions) must be "picked up" in actual life. On the other hand, the requirements of this actual life are deemed so urgent, that others are disposed to force youths into it before they can possibly have obtained anything like a complete general education. If a plan can be suggested whereby the preparation for business could be combined for a year or two with the general education, surely the advocates of the latter ought to encourage it. But it is said that special education, except in contact with actual business, is often found to be delusive and mischievous. Why not then maintain or even enforce that contact? By actual business is meant profit and loss in *bonâ fide* transactions. There is, at least, as much to be learnt by losing as by winning, and it is commonly said that a

man must burn his fingers who would learn to handle the difficulties of life successfully. It is not necessary, therefore, that a farm or a workshop should pay in order to be instructive, but it is necessary that profit should be aimed at, and the causes of failure be honestly ascertained and publicly avowed. If live stock are at present the principal source of profit and loss to the farmer, it is clear that a thorough knowledge of its value is a most important part of his training. This value varies, 1st, with the age, development, and quality of the animal; 2d, with the state of the market. It is one thing to know what the current price of meat or wool is, and this is in our days easily ascertained without any actual intercourse with a market; it is another thing to know what, according to this market price, is the value at any time of several animals, singly or in lots.

That this knowledge may be better learned upon a farm stocked and conducted for the purpose of giving this instruction, than picked up in actual life even under favourable circumstances, seems to me, at least, a reasonable anticipation, till it shall have been disproved by experience. I am, therefore, taking into consideration how this element of instruction may best be introduced into our proposed county college, which will aim at teaching so much of farming as a youth just over sixteen years of age may learn without giving up his general studies.

There can, I think, be no greater difficulty about exercising a class of young men in estimating the weight of animals, than in training a squad of riflemen to judge distances. If the purchase of lean stock and the public sale of fat stock be part of the system pursued, it will not be hard further to exercise the judgment as to the *capabilities* of animals, and these two considerations—weight and capabilities—determine value. Apart from the superior judgment of the experienced instructor, estimates of value would be tested by actual purchases and sales, and would be verified to a considerable extent by the weigh-bridge, and the measuring-tape, when placed in skilful hands.

Appropriate prizes may be given, so as to excite the spirit of emulation as far as is desirable; or even forms of sweepstakes might be devised, which would give to each student a keener interest in a particular animal, and bring him directly into contact with profit or loss dependent on judgment in stock. Thus in one branch of his practical education, which is of great and growing importance, the agricultural student, while still at college, might obtain valuable training, and one of the objections of practical men to general education, as being a disqualification for special business, might be lessened. At least that contempt for trade, or shame of shop, which I think the public-school education in England has too much promoted, might be broken through if a knowledge of some of the arts and sciences necessary to an honest livelihood were combined with those that are essential to an honourable life.

—I am, yours truly, J. L. Brereton.

OBITUARY.

We have to record the death of Mr Francis Cotterel, Royal Artillery; his diploma bears date May 14, 1851.

Also of Mr Adam Hampson, M.R.C.S., Bolton-le-Moors; his diploma bears date May 23, 1850.

Also, recently, Mr Gavin Clarke, Limerick; his diploma dated August 11, 1847.

Mr Edward Darlington, Armagh; his diploma dated May 19, 1852.

And Mr James Rogerson, Garstang; whose diploma bears date January 22, 1827.

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ORIGINAL COMMUNICATIONS AND CASES.

Observations on the Constituent Bones of the Horse's Knee, with Practical Deductions on the Economy of that Region of the Limb. By JOSEPH GAMGEE, Sen.

THAT there should be any uncertainty or difference of opinion amongst anatomists as to the number of bones which enter into the formation of the perfectly-constructed knee of the horse, is a proposition which few will be prepared to see submitted for solution.

Every good judge of the horse knows that one characteristic feature of a good wearing limb is a well-pronounced construction of the knee; nor does that perfection ever exist abstractedly, but as the centre point of a symmetrically formed and powerful limb.

I will not enter at length on what every anatomist knows, to show that the region, which by universal consent has been called the knee, bears no analogy in the horse to the joint of the same name in man. But anatomically and physiologically regarded, the wrist of man and the knee of the horse and other quadrupeds are the same. Details would be superfluous here to show the special differences between the connexions and actions of the human hand on the "carpus," and the relative phenomena as they are observed in the horse, &c. Suffice it to say, that in all the leading features, physiologically considered, the similarity is remarkable.

The father amongst British anatomists of the horse, "Stubbs," gives the names of the bones of the knee after the nomenclature which had already been adopted by human anatomists, in their description of the several bones composing the wrist of man. Stubbs says, that instead of eight bones, as in man, the horse's knee has only seven; and that it is the "trapezium," or inner bone of the radial order, that is wanting in that animal.

Mr Blaine, again, says, "The carpus or knee is composed of seven bones."

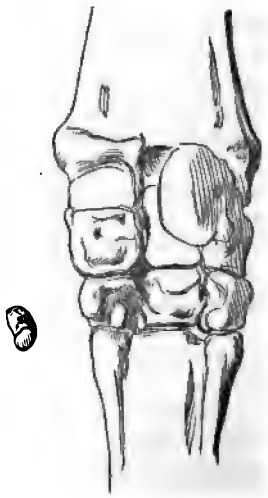
Mr Perceval adds: "The carpus is composed of seven bones; but in some instances an eighth has been found; the situation of which is behind the trapezoid bone; its form is orbicular or pea-shaped. Use not apparent."

In their "General and Descriptive Anatomy of the Domestic Animals," by Messrs John Gamgee and James Law, is to be found the following:—"The trapezium, when present, which is generally the case in old horses, is a small rounded bone, placed at the posterior internal part of the range, and imbedded in the internal lateral ligament, immediately above the head of the small metacarpal bone. We have seen it provided with two facets, one for the metacarpal bone, the other for the trapezoid," (Dr Monastier.)

In this work referred to, published in 1861, is found an advance upon the descriptions of former authors. Some details, not before noticed, are given. The general presence, though occasional absence, of the "trapezium" bone, and its articulations with other bones, are the most important observations made, to be regarded as first instalments of correctly described phenomena, bearing on the questions mooted by Mr Perceval, about the little bone which he speaks of, but does not state to have seen himself.

My own part of the investigation began where the above authorities left the subject, at a time when I was deeply interested in tracing out the functions of the foot, by first making myself acquainted with the new aspects which I was acquiring, of every structure from the sole of the hoof upwards, and *vice versâ*, then by making out the blending of functions, so that systems become apparent, resolvable again into local phenomena. In proceeding, I adopted my usual plan of dismissing all hearsay learning, as well as notions, imbibed without sufficient labour having been devoted to the object of inquiry. Dissections of the knees of horses, and of every region of the limb, for the special object, was the means I adopted.

The following illustration represents the bone in its fullest development:—



The trapezium bone of the off knee of a horse, from which this drawing was taken, is of the form and dimensions as follows:—Shape oblong, slightly flattened, its inner surface irregularly concave, with a facet for articulation, corresponding to one on the trapezoid bone, against which it abuts; the outer or backward surface is convex. The bone is obtuse at both ends, has least thickness at the centre, is everywhere on its surface adapted for the attachment of the ligament, and resembles, in its general exterior aspects, the patella of smaller animals, such as that of the dog or hare.

It measures in its long axis 11-16ths of an inch; its breadth over the centre is 7-16ths; and the thickness through the middle of its *flattened* aspect is 4-12ths of an inch.

Position.—The bone is invested by a short massive ligament, which is strongly attached to the head of the splint bone and outer posterior surface of the scaphoid, the innermost and largest of the upper range of carpal bones. The trapezoid intervenes, and is the bone on which the scaphoid revolves; therefore, as the ligament bridges over a concavity in the space from one prominent point to another, the trapezium bone forms a *point d'appui* by virtue of the static function of the trapezoid; hence a fulcrum is derived, greatly augmenting the energy of the lateral ligament.

When I had made out the use of the trapezium bone, I began, after making dissections on several different subjects, to question the accuracy of the reports, of its ever being absent, finding excuse for the oversight, in the fact that, being a sessamoid bone, it is not held in, connectedly, like the other bones of the joint, but is placed behind the inner of the lower row, imbedded in the strong ligament described; the bone itself escaping the notice of any but the expert dissecter; and whenever recourse has been had to means for obtaining the separate bones of the knee, either by boiling or maceration, until the soft parts have been detached, the trapezium may have passed unobserved, with its ligament.

Continuing my researches, however, it was not long before I came to subjects, in the construction of whose knees the trapezium bones formed no part; and this led me to pause, examine, and proceed further on in my course of research. Up to this point I had dissected the legs of horses indiscriminately as I found them; but now I made choice of those well-formed and of the opposite—viz., of weak, lame, and defective animals. Several of those I observed in couples, and also learned the history of some of the horses, and I soon established the proof, as I had anticipated, from the knowledge I had acquired of the office of the "trapezium," that it was present in all the well-constructed, strong knees, and absent in most of those of horses whose forelegs were bent at the knee, the lame and weak, which had been of little worth. Several such specimens were labelled as they came to hand, and are placed amongst my own collection in the New Veterinary College Museum, where they are available for demonstration and comparative study. Besides establishing, or rather confirming, the fact of the trapezium bone being present in some subjects and absent in others, I discovered that in intermediate cases it is present in various degrees of development.

In reply, by anticipation, to the question: To what use can the knowledge of the before-related phenomena be applied?

Though in the present instance I can give the answer, I beg on principle to state, that it is never absolutely incumbent on the observer of facts and things, to discover their exact and general adaptation for given purposes. These remarks apply especially to students, who, in our profession, are apt to omit to prosecute researches and accumulate details, which, when in order, constitute the separate links out of which substantial chains, or systems are founded.

The chemist works on, discovers, and resolves bodies into their elements. The astronomer watches, both in the calm and the stormy night, ready to observe anything; and so we might go on enumerating how inquiring minds penetrate into natural phenomena and natural laws, without any preconceived notion of the exact kind and extent of use these researches may prove to be of to mankind.

My observations go, then, to establish the fact, that in the perfectly-constructed knee of the horse there are eight bones, the same number as compose the wrist of man; and that where the "trapezium" bone is wanting, the horse is weak, and relatively of lower value than if it were present.

In speaking of the horse's knee, according to custom we say the knee-joint; inadequate not to say erroneous description this, because the region spoken of comprises a series of distinct joints, into the formation of which twelve bones enter, including two shaft bones, the radius and large metacarpal bone.

Examination of these bones, individually and in groups, is the proper way to proceed in the investigation into the functions of the foot, so important to be known, and by no less systematic method to be adequately learned.

The four carpal bones of the upper or radial order are powerfully effective in all action—their economy is of the dynamic, in contradistinction to the lower range of bones, including the trapezium, all of which are static in their assigned functions; equally so are the two splint bones, situated immediately behind and below the lower carpal bones.

To realise thoroughly a knowledge of the functions of the horse's knee, attention should be devoted to the distal extremity of the limb, which, from the knee downwards, is demonstrably composed of three regions.

As further observations are carried on by a multitude of workers, though the trapezium bone cannot be defined in the living animal, its presence or absence may be known by the formation of the knee, whereby selection, or rejection, and the estimation of the value of the animal may be determined on; but where, perhaps, the knowledge here sought to be established will be of the most direct and extensive use, is in the choice and rejection of parent horse stock to breed from.

Probably no known defect common to horses, or any disease to which they are liable, would so certainly be inherited by the offspring from sire or dam, as deviations in construction like that under contemplation.

Though it is good policy to adhere to the plan, as far as possible, of using sound stock, yet in horses both sire and dam have often been subjected to such obvious causes of imperfect development and deterioration, that under normal conditions, and in the performance of ordinary work, no infirmities would have appeared. These remarks hold good in a large proportion of cases of lameness, where, like the

soldier returning from many battles whose scars will only impart honour to his offspring, so we find it with horses, the victims of severe ordeals.

Very different is the case where such an anomaly as the hereditary want of a part is engendered. There like will be almost sure to beget like in many of the produce. The phenomena is of a kind like that of breeding from the bovine species, or sheep with varied length of horns, or the absence of horns; again, as to colours of animals. In fact, man can, with knowledge, exert great influence over the construction, features, and usefulness of domestic animals; a fact so generally admitted that it were needless to urge attention to it more persistently.

HEALTH OF STOCK RETURNS FOR 1864.

ENGLAND.

BEDFORDSHIRE.—*T. Brown, Wing, near Leighton Buzzard.*—Diseases among horses and cattle have been much less prevalent than usual. Animals affected with pleuro-pneumonia and other contagious diseases are, by general consent, excluded from the markets, and such maladies are rare. Black quarter, splenic apoplexy, and parturient fever, have occurred to a slight extent. Indigestion, with tympanitis, was very prevalent about Michaelmas, as was believed, in consequence of bad water, there having been a great scarcity all summer. Ophthalmia was common in February among sheep and lambs exposed to cold winds. Thousands of pigs had died within a radius of ten miles, presenting the following symptoms:—loathing of food, prostration of strength, staggering gait, and constipation on the first day, succeeded on the second by diarrhœa. The pigs die in a few days, and present red blotches on the lungs, liver, and mesentery, and marks of extensive inflammation of the bowels.

CHESTER.—*Walter Lewis, Crewe.*—"Pleuro-pneumonia has not been so prevalent or fatal as in some previous years. It appeared on five or six farms. On three of these, its presence, I believe, was due to the introduction of cattle—black and white heifers—said to have been imported from Holland. In two of these cases, the Dutch cattle (so called) were bought at fairs about June, and remained apparently healthy till about the beginning of November, when pleuro-pneumonia appeared almost simultaneously on the two farms, though some ten miles apart. Two heifers died on one farm, and three on the other. I inoculated the remainder, and have not heard of any cases having since occurred." Foot and mouth disease prevailed among the cattle and pigs on three or four farms. Affections of the respiratory organs have not exceeded the average, but colic and enteritis have been more

than usually common. Black quarter has prevailed to a slight extent, but splenic apoplexy has not been met with. Parturient fever was infrequent. Ophthalmia attacked four cattle at once on the same farm. Sheep have been healthy, but many pigs have died, presenting symptoms of quick breathing, loss of power in the limbs, and discoloration of the body.

CORNWALL.—*Edward Hire, Penzance.*—Contagious diseases infrequent. Three or four cases of glanders. Pleuro-pneumonia has been unknown for six years, though cattle are frequently imported from Spain. Epizootic aphtha was imported in 1859, and extended considerably for a time. Diseases of the respiratory organs are frequent, especially pleurisy; but, as a rule, are not fatal. Those of the digestive organs are common, particularly colic, from horses taking draughts of cold water coming from the mines. Enteritis is often fatal. Black quarter, dropping after calving, and red water, were occasionally met with, and diarrhœa in calves was very prevalent.

CUMBERLAND.—*Henry Thomson, Aspatria.*—Contagious diseases not prevalent, with the exception of epizootic aphtha, which occurred extensively among cattle and sheep. Hydrophobia occurred in about a dozen dogs and pigs, as the result of the bites of a single rabid dog. Black quarter was exceedingly common among yearling stirks, and splenic apoplexy attacked half a dozen animals on badly drained land, proving fatal in all cases but one, in from four to six hours. The last case recovered. Red water in cattle was very prevalent on the same kind of land as splenic apoplexy—"in my opinion these two diseases are very analogous to each other." Parturient fever was very common in spring during the prevalence of east winds. Influenza and other diseases of the respiratory organs common, also constipation and colic. Wind very prevalent among horses. Diarrhœa made great havoc among yearling stirks, appearing equally on all lands. The cattle attacked are such as have been left night and day in the fields since they were six months, and the *post-mortem* examination reveals the presence of enormous numbers of flukes in the liver. Constipation is very prevalent among high bred cattle; laminitis occurs from feeding cattle on raw potatoes; and stomach staggers in young cattle was prevalent during July and August The young cattle suffer from diarrhœa, lose flesh, and in some cases die from shedding their temporary teeth. Measles has been very prevalent in pigs. Rot has occurred to a limited extent among sheep; in the previous year (1863) it was very destructive.

DERBYSHIRE.—*T. Shenton, Bakewell.*—Pleuro-pneumonia and epizootic aphtha have been much less prevalent than usual. "This I attribute to the farmer being more cautious in the purchase of Irish and other stock, that have brought it into this neighbourhood before." One case of glanders occurred. Affections of the respiratory organs were below

the average of previous years, and disorders of the digestive organs considerably above the usual. Periodic ophthalmia is rare in the district. Black quarter prevailed extensively in autumn. There was little parturient fever, but much red water among cattle, the latter being attributed to the dry summer, which had rendered the natural grasses more indigestible. Many lambs perished from filaria in the bronchia. Many were saved by the early administration of turpentine and tincture of assafœtida.

R. Poyser, Worksworth.—No cases of pleuro-pneumonia have come under my care; but I believe I am correct in saying that about thirty head of cattle have been lost or destroyed on one farm within four miles of Worksworth. Scab has occurred among the sheep on one farm, and several have been killed by the nostrums employed for the destruction of the insect. Pleuro-pneumonia was very frequent among horses. In January there were "many cases of what is termed 'influenza,' when there is great exhaustion, debility, and implication of every organ in the body, but especially of the mucous membranes; discharges from the eyes and nose, the former completely closed by œdematous tumefaction. The legs in every case are swollen to an enormous extent, bowels constipated, fæces fetid, covered with mucus, and sometimes streaked with blood; the breathing and pulse quick, the latter being small and hard, and the extremities and general integument cold." They recover well under judicious treatment. Enteritis, colic, and impaction have been common. Black quarter existed to a limited extent. Ophthalmia in cattle was prevalent in the latter part of summer and early autumn; it was not treated, and the general result was, the loss of the eyesight on one or both sides. Generally, one only is affected.

DEVONSHIRE.—*Robert Dyer, Torquay.*—Pleuro-pneumonia was extensively prevalent in the district during the summer and autumn. The majority of cases proved fatal. Some of them were ushered in by attacks of indigestion, accompanied with *hoove;* these cases would appear to recover, but soon proclaim themselves true cases of pleuro-pneumonia. All of them, I believe, were produced by contagion. In one field the disease was rife, and many died. Cows in the adjoining field were not attacked for many weeks after the disease had disappeared from the other field. Bronchitis and pneumonia occurred among horses to a limited extent, and during the latter part of 1864 inflammatory sore throat prevailed extensively; but all the cases recovered in from ten days to a fortnight. Chronic cough is common among horses. Affections of the digestive organs have been of frequent occurrence, but not fatal. Ophthalmia was seen chiefly in Irish horses, and speedily terminated in blindness. Lamenesses are common, owing to the hilly character of the neighbourhood. Red water in cows was frequent, but was usually relieved in a day or two. Calves suffered considerably from diarrhœa.

William Miller, Bradninch, Cullompton.—Pleuro-pneumonia

rarely visits the neighbourhood, the cattle being home-bred. When it does appear it is in isolated cases, and does not spread from farm to farm. Every case that I have seen or heard of has been traced to cattle from a distance. No epizootic aphtha. Scab in sheep is common, leading often to litigation and recovery of damages for the contamination of stock. Diseases of the respiratory organs have been more prevalent during the latter part of December and first two weeks of January, than they have been for many years. They were mild, and in no case terminated fatally. Black quarter was very fatal to calves nine months old during the months of December and January. The mortality among rearing calves is always very great; death sweeps them off under all sorts of conditions. One year a farmer loses nearly all his calves; while, under the same treatment, he may escape for several years without any deaths. Red water in cattle was very prevalent during the spring of 1864, but never proved fatal. Diarrhœa in calves was less prevalent and more amenable to treatment than in previous years.

DORSETSHIRE.—*A. E. Barrister, Bridport.*—Pleuro-pneumonia has appeared in only one dairy of fifty-eight cows, on a farm where it was never seen before, where there has been no stock imported for several years, no cases for several months within several miles of the place, and no public road through or near the farm. Two of the cows died two days after I was called in. Thirty others were slightly affected, showing the mucous crepitating râle; but none of these died. The fifty-six remaining cows were dosed every four hours for three successive days with flax and gruel, and an ounce and a half each of sweet spirits of nitre and oil of turpentine. Those affected were well blistered with mustard. Sheep suffered extensively from epizootic aphtha, remaining lame for months, and becoming greatly emaciated. Met with ten cases of pleurisy, and twenty of pneumonia—four of which proved fatal. Influenza prevailed extensively. Indigestion, gripes, and enteritis common. Met with twenty cases of periodic ophthalmia. Black quarter existed to a limited extent. Fifty cases of red water occurred, five (treated by farriers) proved fatal. Saw three cases of parturient fever. Several flocks of sheep, and about twenty young cattle, suffered from ophthalmia. Diarrhœa in calves is very destructive; but the farmers never seek veterinary advice for them. Sheep have suffered from inflammation after lambing. While treating some cows for epizootic aphtha, "I put nitrate of potass into a cistern for them to drink, and wash their mouths. In order to test the strength of the fluid, I incautiously dipped my finger into the fluid, and put it into my mouth. A day or two after this, my mouth became fearfully vesicated; and the vesicles underwent similar changes to those of the cows, &c. I had not the least hesitation in pronouncing my complaint to be eczema epizootica."

DURHAM.—Robert Hall, Stockton-on-Tees.—A great many cattle,

both fat and lean, have suffered from pleuro-pneumonia. Though the cattle, as a rule, are hurried off to the slaughterer, thus in part concealing the prevalence of the disease, yet great numbers have come under my notice. The result is not only loss to the farmer, but the plentiful supply of food unfit for human consumption. I believe the disease to originate chiefly in contagion; and this affection, as well as foot-and-mouth disease, and scab, has been very prevalent in the Stockton and Darlington markets. At least 50 per cent. of the lean cattle shown at these places have been affected with epizootic aphtha. This last disease has not only been very prevalent, but has assumed a worse type than of late years. It chiefly affected the feet. Deaths have been numerous, and large numbers have been slaughtered for human food when in a most unfit condition. It leads to a great loss of condition, of time, and of money. In many cases I have known farmers feed farm beasts, and lose considerably in consequence, rather than run the risk of bringing this disease to their sound and perhaps nearly fat animals. Diseases of the respiratory and digestive organs have been about an average. Black quarter was abundant, and the carcases were sometimes used for food. Many deaths from parturient fever, and the carcases were often dressed for sale. Red water was below, and diarrhœa in calves about, the average. Sheep suffered from foot-rot, and pigs from measles.

ESSEX.—*Clement H. Hurrel, Southminster, near Maldon.*—Very few cases of pleuro-pneumonia have been met with. Epizootic aphtha greatly less than in the preceding year. Markets generally pretty free from these diseases. Diseases of the respiratory and digestive organs have been very frequent. Disorder of the liver predominated. Periodic ophthalmia was very common. Black quarter was more prevalent than for many years before; generally attacking young stock both in the uplands and the marshes. Splenic apoplexy was very uncommon. I have seen three or four beasts that died suddenly with symptoms like those of this disease in every respect; but, on examination after death, the spleens appeared healthy. Parturient fever existed to a limited extent. Diarrhœa in calves was rather frequent, they being purchased from other counties when very young, and subjected to long abstinence, change of milk, &c. Pigs suffered considerably from affections of the respiratory organs.

HAMPSHIRE.—*Charles Smith Green, Alton.*—Very little pleuro-pneumonia or epizootic aphtha. Influenza of the laryngeal type, with parotidean and submaxillary abscesses, was very prevalent among horses. It was rarely fatal, and generally terminated favourably in the course of a fortnight. In some cases there was ophthalmia, while others were followed by laminitis, which did not, however, leave untoward results. There were four cases of parturient fever in cattle, and red water was at once less prevalent and fatal than in the previous year. Sheep have suffered from foot-rot, and pigs have perished.

in large numbers from a fatal disease; but, as I have not seen it, I cannot tell its nature.

HERTFORD.—*T. G. Webb, Bishop-Stratford.*—One case of glanders occurred during the year. About twenty cases of pleuro-pneumonia; the best were sent to the butcher, and the others were treated generally with success. When a farmer bought ten or twenty at a fair, one or two would fall ill, and the others go on satisfactorily. Epizootic aphtha is treated with chalk and gruel by the farmers themselves. Bronchitis was prevalent among farm horses in the spring; they were treated successfully by blistering, and giving calomel, ammonia, and sweet spirits of nitre. In two cases the tracheotomy tube had to be employed. One horse with ossified laryngeal cartilages worked with the tube for twelve months. Constipation was common in horses during the last four months of the year, from feeding on bran, straw, and other indigestible food. The cases were all successfully treated with aloes, calomel, opium, and aconite. Had three cases of scarlatina in farm horses, which all recovered. They got calomel, sweet spirits of nitre, acetate of ammonia, and, when the bowels became costive, oil. If cows are attacked by parturient fever, the owners have them slaughtered at once.

Alfred Prudaines, Great Berkhamstead.—Epizootic aphtha has not been so frequent or severe as in former years. Diseases of the respiratory organs were very prevalent during autumn and winter, generally in the form of epidemic influenza. Affections of the digestive organs have been very frequent since hay time, the hay being scarce and much straw, &c., used instead. Purpura hæmorrhagica is rare and seen only as the sequel of some other debilitating disease. Black quarter and diarrhœa in calves existed to a limited extent. Parturient fever was less prevalent than usual. Amongst pigs an epidemic and highly infectious enteric fever has been extremely fatal, destroying, in many instances, from fifty to eighty per cent. It is most fatal in young pigs. All treatment appears almost futile when it rages; and although very infectious, there is clearly some other mode of its spreading. Its symptoms are varied as such fevers usually are, but I agree with the name given it, because it most frequently attacks the bowels. In other instances it seizes the lungs or the brain, and not unfrequently it breaks out on the skin.

Thomas R. Scruby, Royston.—Markets small and generally very healthy. Epizootic aphtha was met with occasionally in cattle brought from fairs. Affections of the respiratory organs in horses have been very prevalent for the last six months, but by no means fatal. Bowel diseases unfrequent. A few cases of ophthalmia among horses. Dropping after calving occurred in six cows, two died, the others seemed chiefly affected with paralysis of the hind extremities. A great many pigs died at the commencement of the year, but I did not see any. Lambing—some places good, at others unsatisfactory; one farmer lost from ninety to a hundred lambs; but as he was not one of my clients, I did not see them.

HUNTINGDON.—*B. Garner, St Ives.*—Pleuro-pneumonia has come less under my notice than last year. It is mostly Irish beasts that suffer, and it generally ends in death. Epizootic disease has been very prevalent. The markets usually contain diseased animals. I believe I have had epizootic aphtha myself several times while attending cattle. Influenza has prevailed. Diseases of the digestive organs have been comparatively few. Horses have suffered to a limited extent from ophthalmia. Black quarter is generally very fatal. Cases of dropping after calving, ophthalmia in cattle, and diarrhœa, have been met with, but in no great numbers.

KENT.—*Charles Churchouse, Maidstone.*—Isolated cases of glanders and farcy, and of pleuro-pneumonia were met with, the latter generally confined to Irish and other cattle that have been driven through the country. It seldom extends from these. Epizootic aphtha was prevalent in the early part of the year, having been brought by animals exposed at fairs. Horses have suffered little from diseases of the respiratory or digestive organs. Influenza has prevailed, but was not fatal, except when the system was debilitated. It affected chiefly the eyes, the mucous membranes of the bowels, and the muscular system. In that form affecting the eyes, there was extensive effusion into the anterior chamber; but they generally recovered. A few cases of splenic apoplexy occurred, due to high feeding and want of exercise. Several fatal cases of parturient fever.

F. R. Ingersoh, Lewisham.—About half-a-dozen cases of glanders. One case of rabies in a dog. Pleuro-pneumonia was very prevalent in the large dairies where they are constantly purchasing cattle. It is chiefly brought with the Dutch cattle; it is no uncommon thing for a farmer to buy ten or twelve Dutch beasts, and in less than a week all of them will be affected with pleuro-pneumonia. Foot and mouth disease has prevailed to a very large extent, both in cattle and pigs: scarcely a farm escaped. A boy employed on one of the farms, suffered severely with the disease. Scab in sheep existed to a slight extent. Influenza was very general in horses. Diseases of the digestive organs few. A few cases of periodic ophthalmia. Only two cases of black quarter. Several instances of dropping after calving. Diarrhœa in calves rather prevalent. Rot in sheep existed to some extent.

R. Fletcher, Rochester.—Very few cases of contagious diseases; two of pleuro-pneumonia, and twelve of foot and mouth disease. I never hear of any being taken into market in this part of the county. Diseases of the respiratory organs were few in number. Distension of the stomach was frequent. One case only of ophthalmia. The cows in this district are very highly fed, and many die from parturient fever.

George Fordham, Willesborough.—Three cases of pleuro-pneumonia occurred among a stock of thirty-seven fat animals. They had been bought in the London market when calves, but there had been no disease on adjoining farms or elsewhere in my practice, and no stock

had been bought in on the farm for many months before the outbreak. A few cases of epizootic aphtha in Irish and Welsh beasts that had been drifted. Influenza was very common, and in young horses strangles. Disease affecting the whole alimentary canal has been very common. It assumed, in many cases, an epidemic character, and was associated with low fever and prostration of the vital powers. Ophthalmia occasionally seen. Parturient fever common. Diarrhœa occasionally among calves artificially reared. Great mortality from parasites in lambs during the winter months. Many ewes died a few days before the completion of gestation, with symptoms of apoplexy and loss of motive power—the majority of them having twins, and several three lambs. Several deaths from heaving pains. Abortion was common among ewes.

LANCASTER.—*E. Lawton, Ashton-under-Lyne.*—Some cases of hydrophobia. Pleuro-pneumonia less than in 1863: generally supposed to be got by market cattle; are always disposed of when detected. Influenza was very prevalent, showing itself by quick pulse and breathing, shivering fits, loss of appetite, and great prostration. Generally yielded to proper treatment. The ordinary amount of diseases of the digestive organs.

Joseph Welsby, Prescot, Liverpool.—Two cases of glanders in horses and six of rabies in dogs. Pleuro-pneumonia extensively prevalent; but I am rarely called to treat them. By the adoption of preventative measures the number sent into the market diseased can usually be restricted to ten per cent. Epizootic aphtha prevailed extensively during the past year, having been brought by pigs from Ireland. I have had it on two occasions during the year. It affected the parts between the fingers and the mouth; on one occasion I had to live on liquids for two days. Several farm-servants had it very severely. Diseases of the respiratory and digestive organs were below the average. Two or three cases of periodic ophthalmia. Black quarter scarce. Parturient fever very unusually prevalent. Few cases of red water, and no cases of ophthalmia in cattle except from hearsay. The general state of the markets is such that people are afraid to buy in them.

LEICESTER.—*Edward Ganton, Loughborough.*—There was a great number of cases of pleuro-pneumonia among Irish and Dutch cattle; but there were few among home-bred beasts. Epizootic aphtha existed in a mild form during the summer. Scab in sheep was less prevalent than in the previous year. Many animals were exhibited in the markets affected with those two last diseases. Diseases of the digestive organs were numerous, but not fatal during the winter. Diseases of the digestive organs were also abundant. Black quarter raged extensively during the last few months of the year. Two cases of splenic apoplexy. Parturient fever and red water less than usually frequent. Many calves died from diarrhœa. Sheep also suffered from diarrhœa, and pigs from pleuro-pneumonia.

LINCOLNSHIRE.—*Charles J. Whitworth.*—Have had several outbreaks of pleuro-pneumonia. Scab in sheep was never so prevalent in Lincolnshire before. Influenza, with low fever, was very prevalent; there was no discharge from the nose, but intense fever. A few cases of black quarter, though the country generally is well drained. Several instances of parturient fever. On one farm several cows dropped previously to calving, and suffered from paralysis. We treated successfully by nursing and stimulants, and, after calving, nervine tonics. We have treated several flocks of lambs for strongylus filaria in the bronchia.

Mr A. H. Santy, Market Deeping.—Pleuro-pneumonia was less frequent than in 1863. If taken in time they usually got better under the use of creosote, setons, and blisters, with good living generally. When an outbreak takes place I always seton the whole herd with advantage. Epizootic aphtha and scab have been less prevalent than usual. Influenza was very rife among horses during the early part of the year. Obstinate cases of constipation were common. Black quarter occurred extensively in calves, and parturient fever in cows. Two cases of red water, and two of ophthalmia in cattle. Diarrhœa in calves existed to a limited extent.

M. Heys, Brigg.—Pleuro-pneumonia was extensively prevalent, but in a milder form than is common. Epizootic aphtha, sometimes accompanied by paralysis, sometimes simple aphtha. Scab has been very prevalent among sheep. Diseases of the respiratory organs have been common, and especially influenza. Many cases of disorders of the digestive organs last year were accompanied by paralysis. Occasional cases of black quarter and splenic apoplexy. Cows suffered extensively from parturient fever and red water; the latter bring disease of the digestive organs. Diarrhœa existed extensively among calves. Besides scab, sheep suffered from foot-rot, diarrhœa, and a uterine affection before lambing. Pigs had measles and disease of the digestive organs, with paralysis. Many people have suffered from a mild form of aphtha.

R. W. Dobson.—No case of rabies in the district for the past twelve years. At that time several hundreds of sheep suffered in one district, having been bitten by mad dogs. Only isolated cases of pleuro-pneumonia, and almost exclusively among newly-purchased animals. Epizootic aphtha was more general during the early part of the year 1864 than any previous year since its first appearance. It attacked sheep and pigs extensively, as well as cattle. I have seen several shepherds and their helpers suffer from the mouth disease. Their tongues and lips bear the closest resemblance to the appearances witnessed in the lower animals. Scab more prevalent than for many years. Scarcely a farm is free from it. Most of the farms have either public or occupation roads through them. Affections of the respiratory organs existed to a limited extent. In the early part of the year there were a few cases of influenza, but in no unusual form. During summer and autumn catarrhs. Diseases of the digestive organs decidedly diminished in number, from the more general use

of oil-cake, which acts as a correcter of imperfect digestion. Black quarter above an average, attacking young beasts, from six to fifteen months old, principally. I never saw a single beast recover in my thirty years' practice. During January and February I had twenty-five cases of splenic apoplexy, belonging to one client, but never saw one alive, as they were taken ill and died before any one noticed them. They all occurred on one occupation, where the yards are placed near the sea, and with a northern exposure, and but little shelter. The cattle were well fed, laid dry, and well cared for in every respect. They had been purchased the previous September at a fair only eight miles distant. The shepherd had two healthy four-year-old "cots" die from the same character of disease, but more localised, and they lived only a few hours after being noticed. I had only one case of parturient fever. I never knew this disease take on an endemic form in this neighbourhood. Red water is almost unknown, and ophthalmia did not assume an endemic character. Diarrhœa in calves less prevalent than usual.

MIDDLESEX.—*F. C. Bouller, Plumstead, London.*—I have only heard of one case of hydrophobia in the dog during the past year. Several other dogs were bitten, but were immediately destroyed. A boy was bitten on the face, and died from the effects of the bite shortly after. Three or four cases of epizootic aphtha, which were of a mild form, and terminated favourably. During the latter part of the year bronchitis and influenza were very prevalent among horses, the latter assuming an asthenic form, and proving fatal in a great number of cases. Diseases of the digestive organs in the horse have been less prevalent than usual. In the spring an affection of the eye was very prevalent, which, from its character, appeared due to some atmospheric influence. It was confined to the marshy districts, and in many cases the only treatment required was the removal of the affected animals to hill pasture. In this district few cattle or sheep are kept, and consequently such diseases as pleuro-pneumonia, black quarter, and splenic apoplexy are rarely seen. Horses were comparatively healthy until November, when influenza broke out. Its most prominent symptom was great debility, and generally terminated fatally in from two to four days, if not properly treated in the early stage. It seemed to attack the better class of horses, and those in good condition. In one yard where twenty-four horses were kept, some for carriage purposes, and others for jobbing work, the carriage horses, which were in good condition, and kept in the best ventilated stables, suffered from the disease in its most acute form; whilst the jobbing horses, in low condition, and kept in worse stables, were comparatively free.

NORFOLK.—*J. D. Overed, Blofield.*—Pleuro-pneumonia in cattle has been less prevalent than in former years. The majority of cases have occurred singly, and of a very mild nature. At least fifty per cent.

of the affected animals have recovered. In only two instances has the disease simulated an outbreak. The first occurred among a lot of short-horned bullocks. Several cases followed each other in rapid succession, and the remainder of the animals were sold to the butcher. The second outbreak occurred in November, among some small Dutch heifers, of which three were attacked. They were placed under treatment, and recovered. The other case terminated fatally in two days. Foot and mouth disease has been very common among cattle; but as it generally yields in a few days to good nursing, the aid of a veterinary surgeon is seldom required. Several cases of a very severe nature have occurred in my practice during the past year. In one instance the hoofs dropped off, and large abscesses formed in the mouth and pharynx. This case terminated fatally. Diseases of the digestive organs have been rather prevalent among horses, due mostly to improper feeding. Three or four cases of black quarter in young cattle—all terminating fatally. Red water in cattle common, but the great majority of cases have recovered. Sheep have been comparatively healthy during the past year. Pneumonia and purpura hæmorrhagica have been very prevalent among pigs. We often see cattle suffering from epizootic aphtha and pleuro-pneumonia exposed for sale in our public markets. Scabby sheep rarely seen.

NORTHAMPTON.—*Jacob Dawson, Kettering.*—Pleuro-pneumonia in cattle has been very prevalent in this district during the past year, appearing mostly among bullocks bought at fairs, but in many instances only one or two cases have occurred in a stock, owing to the segregation of the affected animals, and the adoption of other preventive measures. Veterinary surgeons are seldom called upon to treat this disease, but I have found the use of salines in the early stage, followed up by the administration of vegetable and ferruginous tonics, prove very beneficial. There can be no doubt of the contagious nature of pleuro-pneumonia; and I am convinced that proper market and railway regulations, along with other sanitary improvements, would do much to rid the country of this disease. Foot-and-mouth disease prevails to a great extent in this district, but as it generally yields to good nursing in a few days the veterinary surgeon is seldom called in to treat such cases. Scab in sheep very common during the summer and autumn, treated in most cases with mercurial ointment. In the spring a large proportion of the farm horses in this district were affected with a very malignant form of fever, (scarlatina.) The disease was most virulent on its first appearance, but afterwards assumed a milder form, and ultimately disappeared; only a few cases proved fatal. Constipation, accompanied with colicky pains, very common among horses during the summer. On several farms black quarter proved very destructive among young cattle in the autumn, but in most cases setons in the dewlap, and the periodical use of saline diuretics, check the spread of the disease. No cases of splenic apoplexy, and parturient fever less prevalent than usual. The prin-

cipal diseases I have observed in sheep have been hoose in lambs, black-quarter and red-water. Pigs have suffered chiefly from epizootic aphtha and measles. Cattle affected with foot and mouth disease, pleuro-pneumonia, and other contagious diseases, are exposed for sale in our public markets; and sheep suffering from scab are often sold as perfectly sound. Sheep suffer in large numbers from the effects of mercurial ointment applied externally; many cases of this kind have come under my notice. The animals die suddenly as if suffering from a malignant blood disease, *post-mortem* appearances similar to those of black quarter. Mr Dawson adds, he has known one shepherd suffer twice from epizootic aphtha, after attending animals affected with this disease.

John Parton, Berry, Northampton.—Influenza, pleurisy, and pneumonia, very prevalent among horses during the month of December; about the average number of cases of diseases of the digestive organs in horses. Hoose in calves has been very common, in most cases complicated with obstinate diarrhœa. The most common diseases of sheep are diarrhœa in ewes. Hoose and diarrhœa in lambs; and in many cases sheep suffer from the application of mercurial ointment in the treatment of scab. Pneumonia has in many cases proved fatal among pigs.

NOTTINGHAM.—*W. Cope, Newark.*—Glanders and farcy in horses very much on the increase, more especially among post and boat horses. A few cases of pleuro-pneumonia in cattle, the result of contagion. Epizootic aphtha very prevalent among dairy stock and young cattle, due to contagion. Scab in sheep prevalent. Black quarter in cattle has prevailed to a considerable extent, and in every case proved fatal. Parturient fever very common, owing to dairy stock being always kept in high condition. Diarrhœa in calves very common during the spring months, in many instances terminating fatally. Diseases of the respiratory organs in horses very prevalent; and owing to improper feeding, diseases of the digestive organs were also very common. Cattle affected with pleuro-pneumonia are seldom exposed for sale in the market here, but we frequently meet with cases of foot-and-mouth disease, both in cattle and sheep, in our public fairs. Scabby sheep often sold as sound. I have often seen men suffer from eruptions on the hands while attending to animals affected with epizootic aphtha.

Thomas Newton, Worksop.—I have only seen three cases of pleuro-pneumonia in cattle during the past year, two of which recovered. The whole of these cases seemed to originate spontaneously; so far as I could learn, none of these animals had been brought in contact with other cattle. Foot-and-mouth disease has been very prevalent among cattle; and a few cases of this disease have occurred in pigs in this district during the year. I have only had two cases of splenic apoplexy, and three of parturient fever, for the last twelve months. *Diarrhœa* and hoose in calves have been very prevalent. Among

horses cases of influenza and bronchitis were very common, but comparatively few cases of diseases of the digestive organs occurred. In the autumn large numbers of sheep and lambs were affected with diarrhœa. Animals exposed for sale in our public markets have been very free of contagious diseases throughout the whole year.

R. S. Wilson, Olleston.—Glanders and farcy in horses are rarely seen in this district, and no cases of pleuro-pneumonia in cattle have been seen for the last two or three years. I am constantly seeing cases of foot-and-mouth disease in cattle, sheep, and pigs; in fact, this district never seems to be thoroughly free of this disease. Scab in sheep is by no means uncommon, but farmers always try to keep an outbreak of this disease as secret as possible. Purpura hæmorrhagica and periodic ophthalmia in horses very uncommon, but diseases of the respiratory and digestive organs prevail to a great extent. Splenic apoplexy rarely seen, and the number of cases of black quarter and red water in cattle are decreasing yearly, owing to the improvement of the land and better management of stock. Parturient fever very common, but in most cases I believe it is the result of improper management, and change of food about the time of calving. I have never been called to a case where I could not discover some change of diet. Bran mashes given to cows not accustomed to them often cause the disease, but where cows are kept on rather a short allowance of their ordinary food few if any cases occur. Diarrhœa in calves very prevalent, and for the past two years I have seen a great many calves suffering from paralysis of motion in the posterior extremities, sensation normal, but the animals are unable to get up; in such cases I administer oil, and put a smart blister over the loins, after which they usually recover in the course of three weeks or a month. I have often heard persons attending animals affected with epizootic aphtha complain of suffering from the disease, but I have not seen a case of this kind myself.

OXFORD.—*W. Bennett, Banbury.*—Four cases of farcy in horses have been brought under my notice during the past year, but I have not seen a single case of glanders. Pleuro-pneumonia in cattle occasionally breaks out in this district as the result of contagion, but it has not prevailed to any extent in my practice for several years. Epizootic aphtha very prevalent; black quarter, twelve cases; red water in cattle, about twenty cases; diarrhœa in calves common. Influenza and diseases of the respiratory organs in horses have prevailed to a greater extent than usual; diseases of the digestive organs rather below the average. Among sheep the principal diseases have been scab and rot; and among pigs splenic apoplexy has been very prevalent.

SHROPSHIRE.—*Charles Dayas, Longnor.*—Two cases of glanders in horses. Pleuro-pneumonia in cattle has not been prevalent in this district during the past year; but epizootic aphtha very common,

mostly of a mild nature, and many of the affected animals recovered without any medical treatment. Scab in sheep has not been so prevalent as in former years. In spring, diseases of the digestive organs in horses prevailed to a great extent, and in many cases proved fatal; throughout the whole year cases of influenza have been very common. Black quarter has raged a good deal, one-year-old cattle suffering most; some herds of yearlings have been reduced 60 or 70 per cent. from this disease alone. Fewer cases of splenic apoplexy than in former years; parturient fever never prevails to any extent in this district; and we have been nearly free of red water in cattle last year. Ophthalmia in cattle has been very prevalent, assuming the form of an epidemic. Most of the animals have recovered, but in some cases permanent blindness has been the result. Animals exposed for sale in our public markets during the past year have been in general healthy. A few cases of foot-and-mouth disease were to be seen, but so far as I am aware neither cattle affected with pleuro-pneumonia, nor scabby sheep, have ever appeared in any of our markets or fairs.

SOMERSET.—*W. Evans, Ilminster.*—Pleuro-pneumonia in cattle has not prevailed to any extent in this district for the last three or four years. I have met with a good many cases of foot-and-mouth disease during the past year. Diseases of the digestive organs have been most common among horses; in many instances caused by large quantities of dry indigestible food. About the average number of cases of diseases of the respiratory organs.

G. S. Whitmore, Langport.—Pleuro-pneumonia in cattle a few cases; loss about 3 per cent.; foot-and-mouth disease was very prevalent among cattle in the month of February; both pleuro-pneumonia and epizootic aphtha are, in my opinion, due to atmospheric influence. Cases of indigestion in horses caused by hard dry indigestible food were very common, and during the months of September and October gastritis and tympanitis prevailed to the extent of 20 per cent. Ophthalmia and pneumonia in horses about 10 per cent. Black quarter has been rather prevalent, parturient fever about 5 per cent., and red water in cattle 10 per cent. In July, August, and September, cattle suffered a good deal from an affection of the eye, which appeared at first like a small speck on the cornea, gradually increasing in size, and granulations or fungi of a red colour and spongy nature, growing from the centre of the cornea, often presenting the appearance of an ulcer. Rot in sheep is very common in our low pasture grounds, and foot-rot often troublesome. In many of our low pasture grounds, rot is very common both in cattle and sheep, and foot-rot in sheep as high as 30 per cent. I have never seen animals suffering from contagious diseases exposed for sale in our public markets.

SURREY.—*W. F. Cross, Durham House, Battersea.*—Several cases

of glanders in horses, but very few of farcy. This district has been free from foot-and-mouth disease during the past year, and we had comparatively few cases of pleuro-pneumonia in cattle. Horses have been tolerably free from diseases of the digestive organs ; but diseases of the respiratory organs have been very prevalent among draught horses. Several hundreds of pigs have died in this district, presenting the following symptoms :—loss of appetite, panting, sitting on their haunches, and in some cases rapid inflammation of the fore arms, and red patches on various parts of the body. *Post-mortem* appearances—abscesses of the lungs and liver, in some cases the intestines very much inflamed. I and my assistant were daily engaged making *post-mortem* examinations of these pigs, and about the fifth day we both observed red patches, similar to those on the pigs, appearing on our hands and arms; we consulted a medical man, who confirmed our suspicions, that it was caused by our handling the diseased carcases ; we discontinued the *post-mortem* examination, and the eruption disappeared. I am of opinion that the flesh of animals suffering from disease, should never be sold as human food, and proper veterinary inspectors should be appointed to prevent such traffic.

SUSSEX.—*Vincent Vine, Lewes.*—Pleuro-pneumonia in cattle has not been prevalent during the past year, it has mostly affected animals in low condition bought at fairs. Some cases of spontaneous origin on one farm where twenty-three cows are kept; the first case occurred August 17th, the second case September 6th, and third case October 27th. These cows had all been bred and kept on the farm, no fresh stock had been bought, and no cases of pleuro-pneumonia had been observed in the neighbourhood. After the first case occurred I recommended change of pasture, and in addition oil-cake and bran, and the whole herd to go through a regular course of medicine—a plan I have never known to fail in arresting the progress of the disease. I believe pleuro-pneumonia often lies lurking in the system for months, ready to break out when the animal is exposed to any exciting cause, such as heat, cold, wet, short rations, or bad food. Few cases of foot-and-mouth disease compared with former years, and scab in sheep almost unknown in this part of the country. Diseases of the respiratory organs in horses have been very prevalent, more especially catarrh and pneumonia; diseases of the digestive organs rather above the average number of cases. Black quarter prevails to a great extent in this neighbourhood, but I am generally successful in arresting its progress by a change of diet and a little medicine to bring about a healthy condition of the blood. Ophthalmia in cattle was very prevalent during the summer months, and in the autumn many calves were affected with diarrhœa. Cases of parturient fever far more common than usual. In our markets stock are generally healthy, but occasionally a few cases of pleuro-pneumonia and foot-and-mouth disease may be seen.

Last spring pigs suffered from a most fatal affection, as I believe, of the throat. Some seemed well in the morning, and in the evening were found dead; others coughed and pined away, dying in three or four days; in these cases the skin had a pinkish hue, and if the animals lived for about a week the integument was covered with scabs. I have also met recently with rickets in pigs; the joints were swollen, and some of them ulcerating. A farmer in the district lost four calves rather suddenly from eating new burnt oat sheaves cut up with the straw-cutter. The six were left well at night, and the following morning three were found dead. The other three appeared healthy; but one took ill at ten A.M., and died ere my arrival. The other two were ill, but recovered under appropriate treatment. In the one that died the rumen was loaded with indigested food; the omasum impacted; and the rectum congested. These animals fed exclusively on the cut oat sheaves.

William Dowthwaite, Jun., Beverley.—One case of glanders. About four months ago a man died in Beverley from hydrophobia, caused by the bite of a dog; but I have seen no cases of rabies. There were several cases of pleuro-pneumonia during the summer of 1864. Since then there has been very little. I have not seen a case of this contagious disease for three months. All the cases I have seen could always be clearly proved to result from contagion. Epizootic aphtha raged to a great extent during the summer of 1864, especially in the common pastures belonging to the freemen of Beverley. Animals coming from all parts are turned into these pastures without any veterinary inspection. Scab in sheep seems increasing to a large extent. I saw many cases in 1864, and still keep hearing of new ones. Influenza was prevalent among horses during the latter part of 1864, and seems increasing at present, (February.) Diseases of the digestive organs have been unusually frequent, chiefly, I believe, from the horses having too much cut meat. A few cases of periodic ophthalmia occurred during the last six months. Many fine young cattle died from black quarter during the autumn of 1864. A great many good cows died (as usual in the district) from parturient fever. I have only seen two cases of red water for the last six months; it is not prevalent in this district. Sheep have suffered from ophthalmia for the last six months. Diarrhœa existed to some extent among calves. Very little diseased stock has been shown in our markets if we except epizootic aphtha.

Sam. Francis Fallding, Southgate.—There have been few cases of pleuro-pneumonia in my neighbourhood; I only attended six, of which four recovered. Much epizootic aphtha among cattle and pigs; but the veterinary surgeon is never consulted concerning them. This is the only disease that has been seen to any extent in our markets. Affections of the respiratory organs were not prevalent during 1864; but during the past and present months, (January and February,) there have been many cases (in Wakefield) of influenza, or, as Professor Varnell calls it, bilious fever. Colic and obstruction of

the bowels were frequently seen in horses. I had one case of purpura hæmorrhagica, which died twelve hours after I was called in. I had no cases of black quarter during 1864; but it has broken out this month, (February;) it has broken out at two farms in the neighbourhood. One person lost three, of the respective ages of five, eight, and sixteen months; and a fourth, a two-year-old heifer, six months gone in calf. The other farmer only lost a six-months-old calf. There occurred a great number of cases of parturient fever, of which about one in four recovered.

J. Horne, Barnsley.—I have met with a number of isolated cases of pleuro-pneumonia among herds of from ten to twenty. In one or two cases five or six have been lost, and in one instance sixteen. In all the cases I traced the cattle had been bought at market, and many of them had been brought from different parts of the country by railway. The general result was death. Epizootic aphtha has prevailed among cattle and pigs to a very great extent. In many cases it was brought by Irish pigs imported by way of Liverpool. Scab in sheep has existed largely during the whole year. The foot and mouth disease, and scab, have been almost the only diseases seen in our markets. Diseases of the respiratory organs have been moderately prevalent; those of the digestive organs much less so. A few cases of ophthalmia was seen in horses. I saw a few cases of black quarter and parturient fever. Had only two cases of red water, and a few of ophthalmia and diarrhœa in calves. I had also several cases of filaria in the bronchia of calves. Sheep have died to some extent from bronchitis and pneumonia; and pigs have perished in great numbers from some chest affection, the nature of which I am not fully acquainted with.

Edward Hoyland, Barnsley.—I saw many cases of glanders in the end of 1863, caused by contagion; none in 1864. Pleuro-pneumonia prevailed to a large extent among lean cattle imported from Hamburgh. Foot-and-mouth disease was very rife among cattle, sheep, and pigs, the cause being principally contagion. A few cases of scab occurred on one farm. Contagious diseases seem to be chiefly due to lean foreign stock which are brought in large numbers into our markets and are extensively carried in railway trucks. Many of these show no sign of disease until they have been in the owner's possession for two or three weeks, when pleuro-pneumonia breaks out among them. I know a case in which a gentleman suffered from epizootic aphtha obtained by inoculation while drawing the teats of a cow suffering from the disease. The virus entered through some sores on the hand. Diseases of the respiratory organs have been less prevalent than usual among horses—the principal were influenza and catarrh. Affections of the digestive organs were common among agricultural horses, being brought about chiefly by innutritious and bad food, such as chopped wheat straw, &c. Black quarter prevailed to a great extent, and was very fatal during the last three months of 1864. A few cases of splenic apoplexy occurred.

Parturient fever has been less frequent than in previous years, as the farmers do not keep over the first two or three calvings, but feed them for market. Some cases of red water occur in the winter months when cattle are on turnips. Pigs suffered largely from measles. One farmer lost upwards of fifty young pigs from this disease. The health of stock is at present much better than I have known it for some years.

A Paper upon "Influenza in the Horse," read before the Lancashire Veterinary Medical Association in the Royal Institution, Manchester; also before the Yorkshire Veterinary Medical Society at Harrogate. By Mr THOMAS GREAVES, M.R.C.V.S.

MR PRESIDENT AND GENTLEMEN,—I have no desire to conceal the fact that I feel flattered in being permitted to be the first veterinary surgeon who has ever delivered an address upon veterinary science in this noble building: nay, the honour thus conferred upon me creates within me a pardonable pride when I see before me so large a body of enlightened, intelligent, and scientific men, who are my fellow practitioners in this my native town. It is at the express desire of our worthy President that I appear before you on this auspicious occasion; and however much we may regret that the task has not fallen to the lot of some other member who could have handled this most interesting and important subject more ably than I can do—some one who could have imported new thoughts, new and original ideas into it, penetrated it with a new light, the keen scorching light of science, and by these means rendered this paper more interesting, useful, and valuable—I say, however much this is to be regretted, I can assure you, if an anxious desire, coupled with a faithful exercise of my humble abilities, can render this paper worthy of this great occasion, or worthy of your kind approbation, then on these grounds I have a clear title to success.

I shall now bring before your notice the subject we are called together to-night to consider—viz., "Influenza in the Horse," and in doing so, for the sake of order, I shall divide it into three parts—viz., the Cause, Nature, and Treatment.

1*st. The Cause of Influenza.*—The pestilence which walketh in darkness is no fiction. Both sacred and profane writers give ample proof that, from the very earliest times down to the present age, man has been periodically startled by its silent, invisible, mysterious, and awful ravages. I can conceive of no calamity more appalling to contemplate than that of whole districts devastated, and multitudes of human beings swept off in a few hours, or a few days, by some invisible but irresistible agency. Well might the ancients in their terror attribute it to a

destroying angel; but its destructive influence has not been confined to man. Animals have been from time to time swept off in great multitudes. The cause, or causes, appeared at the time inscrutable; but in all probability they were one and the same agency, and their degree of virulence was dependent upon certain modified circumstances. Notwithstanding, whatever may be said to the contrary, a mystery overhangs every epizootic disease, giving rise to vague and contradictory notions in reference to its precise cause. Now, upon this point, as well as upon the point of the nature and treatment of influenza, it will be observed, as we proceed, that I have dared to step out from the beaten tract of routine, and have dared to advance some new theories. I am not abandoning the cause of science and progress by uttering these sentiments. I believe the question to be a question between progress and retrogression, and the issue we have to try is of enormous importance. In the first place—it is quite safe to conclude that this distemper which has ravaged the whole of England and the Continent of Europe during the last winter, emanates from atmospheric causes acting directly upon the organic system of nerves; but what the precise nature of that cause is, our finest tests in science has as yet failed to detect. The conclusions that I have come to are as follows:—in the first place, that that state of the system which we are in the habit of designating "influenza," *is not of itself a disease at all,* it is simply a sequence, or a particular condition of the constitution in which there is an absence of the requisite quantity of nervous energy, deranging the vital principle, inciting irritability. And, secondly, that the system does not become affected through the medium of respiration, but through the medium of the skin. I cannot bring my mind to believe that epizootics of this nature are dependent upon some disproportion of oxygen in the air, or to the presence of sulphuretted hydrogen, or ozone, nor yet to any organic or inorganic morbific matter in the air. I should rather attribute it to some change or modification in the magnetical or electrical state of the atmosphere altering its relations to the living body. I will give you my reasons for these conclusions: if the epizootic was propagated through the medium of respiration the tissues which had come first in contact with the poison or irritant in its unspent or undiluted form would, as a matter of course, suffer the most. If a horse or a man takes an irritant poison of which he dies, what do we find? Why, intense inflammation of the mucous membrane of the stomach and bowels. If a horse or man is half suffocated in the fumes or dense smoke of a fire so that in a few days he dies, what do we find? Why, intense inflammation of the mucous membrane of the air passages and congestion of the lungs; in either case, we find that the very tissues which have come into direct actual contact with the irritant are most severely affected, so should we find it to be the case in influenza if it was caused by some irritant, or morbific poison in the air. But what does *post-mortem* examinations of true influenza cases prove to us? They show us unmistakably it is not so; that fine delicate membrane

in the air cells is nearly always perfectly free from disease; frequently we find these tissues in a state the very reverse of congestion, inflammation, or tumefaction; they are of a lighter colour, are less in weight and less in bulk than when in health, and even in those cases where we have hydrothorax or hydrops pericardii, this has not been preceded by the slightest inflammatory action, it has exhaled out of the surfaces and not exuded. I look upon these facts as almost, if not quite proof positive that it is not attributable to a morbific poison or to a putrescence in the atmosphere.

The true cause of "influenza" must be looked for in the "peculiar condition of the atmosphere and the favourable state of the skin and coat in the animal himself." I consider that the primary cause of this epizootic is a deficiency of electricity in the atmosphere during the whole of the period the distemper is prevalent, and that during the time that that deficiency exists an insensible influence is exerted upon all animals, and the degree that they are affected is in proportion to their susceptibility and favourable conditions. The effects produced are, in the first place, felt in the nervous system; and, secondarily, upon the vascular system. The manner in which it affects the system is by robbing it of a certain quantity of animal electricity in order to effect an equilibrium, a peculiar sensation in many respects simulating. A chill is experienced whilst this abstracting process is going on, a creeping sensation is immediately felt in every part, the horse experiences a pricking, uneasy sensation, frequently attended with rigor, the system being in a perfectly passive state during this time. I consider the abstraction of the invigorating principle is not confined to the solids but the vital fluids also; there is a loss of animal heat, the skin is cold, and if it is permitted to go on radiating the whole system soon becomes thoroughly affected, and the vital powers are thrown prostrate, partaking somewhat of a state of torpidity. It must not be forgotten that the skin is a perfect network of nervous filaments, and that these nervous filaments have both direct and indirect connexion with all the nervous centres, and through them with every vital organ in the body; that there exists between them the most perfect sympathy; no scientific instrument however delicate is more susceptible, or is a more certain indicator. I will give you an example to show that the skin is an agent of vital importance—if I drop a small quantity of spirit upon a mouse I can soon deprive it of life, the evaporation robs the surface of the skin of heat, and the vital organs radiate the nervous energy so rapidly that the functions of life in six minutes cease altogether; again, if I cover completely the skin of a dog or a cat with a thick covering of varnish, so as to isolate the living body from the atmosphere, so as to completely intercept the passage of electricity, the vital or nerve force in the system soon becomes spent and exhausted, and the functions of vitality cannot be continued. I look upon this as a proof that the radiation of heat alone is not the *cause of death* in the former instance, but that it is referable to the

abstraction of vital principle, and in the latter experiment the vital principle existing in the living body has become consumed or exhausted, and incapable of being replenished. This great fact must be steadily borne in mind, that every minute the animal is living, every minute he is dying, every minute he is breathing, every minute there is an exhaustion of a certain amount of vital force, which if not recruited must end in dissolution. My own experience has proved to me that influenza is not dependent upon the low temperature of the air; if cold weather was of itself an exciting cause, we should always find the greatest number of fresh cases on the day or the day after an intensely cold day and night, whereas we do not find that to be the case. I find nearly as many fresh cases during the prevalence of beautiful, fine, dry, warm weather, a clear, crisp atmosphere, as in a wet, dull, murky atmosphere—I mean during the whole time the epizootic is prevalent. A long continuance of east winds may possibly contribute some of the conditions necessary to its development; but of this I am persuaded, whenever epizootic disease is prevalent the mystery is dependent upon some invisible subtle agency operating from without, and exists in the atmosphere; as Mr Youatt said thirty years ago, "It is a vast, a noble field for future research, it will immortalise him who traverses successfully all its paths, but at present it is an undiscovered country in which we should be cautious not to bewilder ourselves."

I do not wish to convey to you the idea that the whole force of the attack is instantaneous; what I want you clearly to understand, supposing an animal in perfect health, in tip-top condition, surrounded and pressed upon by an atmosphere which is in this peculiar state, the rapidity and intensity of the attack will be dependent upon the state of the skin and coat of such animal. As to it acting as a good conductor or a nonconductor, if the animal has a thick coat, or is clothed too much, inducing a damp state of the coat, and whilst in this state permitted to stand starving in a cold stable, or outside in the open air, *that is the precise time the mischief takes place.* There is no process of incubation in this affection. If all the conditions are favourable to radiation his system can contract the affection suddenly, and become infected to a degree entitling it to the term influenza in five minutes; but if the conditions are not so favourable, it will require twenty or thirty minutes' exposure to the same trying circumstances to produce the same effects, and in some less susceptible animals they may tolerate the influence for several days. I am decidedly of opinion there are numbers of horses that are not at all susceptible to the influence, and even those that are susceptible after they have passed through it, with very rare exceptions, enjoy an immunity from it; it would appear the constitution has become inured or accommodated to it, for they shall grow and enjoy perfect health after, and this too in the same atmosphere; not, as may be imagined, that the influence in the atmosphere has spent itself, because that is not the case; that the influence is still existing in the air is proved

by numbers of fresh cases being attacked in other places in the same town; but in length of time it would appear an equilibrium is established, and it is no longer a noxious element, for the whole family of horses become systematised or climatised. Horses occupying the most healthy and best ventilated stables are equally liable to contract the complaint; but there is this in it, with them it is less malignant and less fatal. In this city my experience of it ran a period of about six months, from beginning of November to May.

I wish to call your attention to the fact, that at other times the animals may experience a chill, and have a check of perspiration, and the result will be an ordinary catarrhal affection—viz., sore throat, sore cough, nasal discharge, &c., &c., but when this subtle agency exists in the air, and is exerting itself, another phenomenon is witnessed of entirely different nature, of essentially typhoid tendencies, the distinguishing mark or effect of which is an unusual, peculiar, and general weakness, a most susceptible system, and the small, feeble character of the pulse.

Contagion and Infection.—Is this one of the causes of this epizootic? My experiences have led me to the conclusion that it is not. I have seen much of this distemper, and have watched it closely, but up to the present time I have not observed one single clear instance of an affected animal communicating the distemper to a healthy one. My own horses have, during every day for the last six months, passed close by, even smelling nose to nose with some of the most inveterate and malignant cases; they are frequently put into the very stalls amongst sick horses, and to all appearance they have never had for one moment a vestige of the complaint upon them. I must remind you that contagion, strictly speaking, implies, as you know, the capability of certain diseases being produced by actual contact of the healthy animal with some part of the one labouring under the disease, and not through the medium of the atmosphere; on the other hand, infection is the word used to denote the propagation of maladies through the medium of the air, which becomes charged with the contaminating principle given off in the form of exhalations from the diseased animal, and which excites the like disease in those animals that are subjected to its influence, they being predisposed to take on the malady.

2*d. The Nature of Influenza.*—Most influenzas have been noted for affecting severely the mucous membranes of the air passages, but in this present epizootic, with only rare exceptions, nothing has occurred of the kind that has attracted notice; their phases may vary in several points of detail, but they have all many points in common. I hold in my hand a treatise on "Influenza in the Horse," written by Mr W. C. Spooner, of Southampton, in 1837; it contains not only his own views, but also an ably written essay upon the same subject by Professor Sewell. A very valuable discussion ensued, in which we have the opinions of Professor Spooner, Messrs Field, Turner, Youatt,

Dickins, Braby, Cheetham, Sibbald, and Ainslie. This treatise contains also the opinions of Stewart, Wm. Percival, Karkeek, and others. I have carefully perused the whole of these valuable opinions, also the practical papers written upon the same subject by Professor Barlow, and Finlay Dun, in the *Veterinarian* for 1853, as well as Mr Bloag, Mr Armatage, and many others. I have perused them for the purpose of gleaning knowledge, and rendering these pages more worthy of your approval. I find Professor Sewell, Karkeek, and some other eminent men, attribute "influenza" to a meteoric or volcanic origin; many of them view it as inflammatory in its nature, but since that period times have changed: men's views upon this and many other diseases have undergone important changes, and a change has also taken place in the type of disease; we very rarely now-a-days see a clear and well-defined case of local inflammation. In the present day the constitution of neither man nor animal can tolerate the old-fashioned, heroic, coercive treatment which was formerly employed. Enlightened and scientific men have discovered that in the present day a milder plan of treatment is more successful, it being more in accordance with the altered conditions. I speak this to the honour of our friends Mr William Haycock and Mr E. A. Friend, since they were of the very first who discerned and had enough moral courage to propagate this great truth. For the sake of clearness of description I shall divide this subject into two classes—viz., Influenza, and Complicated Influenza.

Influenza.—This is an Italian word, and means influence. Its primary action is direct upon the nervous system; and, secondarily, upon the vascular system. The animal appears to be suddenly deprived of the requisite quantity of vigour or vital stimulus necessary for the due performance of the vital actions. I am of opinion that the whole system suffers alike; not only the vital organs—viz., the brain, heart, lungs, liver, &c., but every living tissue in the whole frame is deficient in nerve force or animal electricity. The first observable symptoms are cold skin, loss of appetite, dulness, listlessness, pulse small, feeble, becoming quicker and quicker, ranging from 60 to 80,—in some cases getting up to 100 beats in the minute,—breathing not always disturbed, a pricking uneasiness in the legs and feet, an excitable, susceptible state of the bowels, voiding fæces frequently, which are soft and scanty. In some few cases we have spontaneous diarrhœa. These symptoms are followed by swollen eyelids, weeping,—in some severe cases, effusion of lymph into the chambers of the eye. The mouth is not particularly hot, neither are the membranes highly injected. There is more or less swelling in the legs about the fetlocks. This is accompanied with a morbid capillary action generally. It assumes and proceeds in a uniform course, and not by natural and distinct stages. I feel no doubt many of these cases experience headache to a very great extent. In some of my patients, for months after the attack, symptoms approaching to megrims have hung about him, rendering him completely useless,

having occasional fits, if backed, or his head raised suddenly, he would stagger and fall—no doubt resulting from a thickening of the membranes of the brain, meningitis, or effusion into the ventricles. I have had three such cases; bleeding, laxatives, alteratives, and vegetable and mineral tonics were tried without any improvement whatever; but by the employment of long setons, two over the front of the head and two behind the poll, for three or four weeks, completely restored them in each case. The organ which suffers chiefly is the central organ of circulation, the heart; but it is the result of a state of things the very antipodes of congestion or inflammation. It is affected mechanically, not from diseased actions; it is deprived of its wonted vigour; it is unable to empty itself, in its systolic and diastolic action. A portion of blood remains in the ventricles; the heart is feebly but irritably labouring, agitating and beating upon the same charge of blood over and over again. The fibrin of the blood attaches itself to the tricuspid and bicuspid valves and their chords, as well as the chorded tendinea and cortina tendinea, by which the passages are, to a certain extent, choked at each involuntary contraction of the ventricles. An escape of blood back into the ventricle takes place. This state of the central pump will account for the diminished, if not suspended *vis a tergo*, or force from behind; and hence the small, feeble, almost bloodless pulse. For further particulars on this point, I beg to refer you to my paper in the *Veterinarian* for last March. Since I wrote that paper I have been kindly informed that Professor Dick discerned and described the same fact twenty years ago. I was perfectly unaware of this at the time I wrote. There is also another symptom, which, in some cases, occur to a most remarkable degree. My friend, Mr Haycock, reminded me not to omit notice of this symptom. I allude to the great irregularity or intermittency of the pulse. I have observed it in some cases so great, that there has been a total omission of pulsation for five or six seconds; and this occurrence will be repeated three or four times in every minute. This peculiarity will exist all through his illness, and, in some cases, for months after his recovery. I do not attribute any very great importance to this. It is an exceedingly interesting coincidence to notice and to contemplate. I always view it as a favourable omen. I consider it resulting from nervous debility; and I am more than half inclined to believe that in every case where there is an intermittent pulse there exists a clot of blood in the heart. How often do we find horses affected with influenza dying rather unexpectedly. What is the explanation of it? *Post-mortem* examination shows that there was neither active nor chronic disease in any of the vital organs to cause death, nor yet rupture. Of the human being it would be said he died of spasm of the valves of the heart. I have no doubt, in every such death, life passes away in the tranquil sleep of death, through the medium of sinking and syncope. In some few cases it would appear that the whole virulence of the disease concentrates itself in

some local superficial parts—the leg, or between the lower maxillary bone; deep, sloughing ulcers occur, and even in a vital organ, assuming a putrescent character, as if death of the parts had taken place. These cases generally do badly. There is not a sufficiency of vitality to see them through it. Whenever the animal begins to lie down, I find that generally a favourable sign. As they are recovering, they generally lie down a good deal. Some lie down from the first several times a-day, as if they experienced abdominal pains. I have generally found those cases that have swelled most about their eyes have got on most favourably.

Symptoms of Complicated Influenza.—By this term I mean horses with some previous disease upon them becoming attacked with the distemper, or else, whilst suffering under an attack of influenza, it assumes a malignant, subacute form, locating itself in some vital organ. In either case they are dangerous, and will be found most difficult cases to treat. They are intractable, and often running on to tuberculous lungs or effusion. Some of them are not bad to diagnose. There are cases where the pulse and breathing is kept up by debility solely. These can be discriminated, and must not be mistaken for complicated cases, which the more alarming symptoms keep up longer. An unusually foul, clammy mouth, offensive odour, dirty yellow buccal membrane and conjunctiva; you cannot by any means produce and maintain healthy reaction. The bowels are sluggish, the fæces dry, hard, and coated, the secretions generally suspended. The diseased organ will feel the full force of the deficiency of animal electricity, and the result in most such cases is that the parenchyma of the organ yields to the putrid stage, and death, in seven or ten days, closes the scene.

We will now examine this question from another point of view; for I am anxious to make the fullest investigation into the nature of influenza. Let us follow our patient to the knacker's yard, and there make a careful *post-mortem* examination of the dead body, and what do we find? In complicated cases we meet with a great variety of disorganisations and lesions, most extensive, dreadful alterations of structure, generally in the lungs, effusion of lymph outside the pericardium and fibrinous attachments of the pleura; but in simple influenza it is perfectly immaterial whether the subject is an old horse or a young horse; whether he be in a state of high, fleshy condition, or in a low, lean condition. If he has died of influenza there will be no trace whatever of disease in any vital organ obvious to the anatomist; but there will be found one leading feature invariably present—viz., a soft, flabby, pulpy condition of all the muscular structures throughout the body and the whole of the vital organs. These tissues are blanched, and of a pale clay colour, as if the whole system had been blighted, blasted. The fire of vitality has burnt out, leaving a white ash only. It would appear that the arterial blood had lost its vermilion colour. But to elucidate what I mean, and to render my views more clear to you, I will illustrate it by two

examples. I have spoken of nerve force. Now, we all know that a palsied limb is consequent upon either complete or partial loss of nervous power. Now, if a *post-mortem* examination be made of a limb recently palsied, it is found that the flesh is soft, flabby, and pulpy, and of a pale clay colour—exactly the same state as we find in cases that have died of influenza. Again, if we examine a body that has been killed by lightning: Now, it has been my lot to make a *post-mortem* examination of three subjects; one of them a horse; the other two were cows. They had died instantaneously in the field. Being previously in perfect health, I examined them with the utmost care, but could not detect the faintest trace of disease anywhere. There was the same soft, flabby, pulpy state of the flesh, and which was of a pale clay colour in every case, exactly the same as found in influenza subjects. At different points of the body the hair or coat was singed, and a strong smell of burnt hair existed. The skin at these points was black, as if it had been bruised in these spots. The electric fluid had, no doubt, passed in or out at these points. But to call this peculiar condition of the muscular structures disease is, I maintain, a fallacy, as much so as if I were to take you to yonder butcher's shop, show you that white veal, and tell you its very whiteness was dependent upon diseased action. This is the general condition of the muscular structures, of however recent and short duration. I contend that, being struck down by lightning and being attacked by influenza is precisely one and the same thing in nature. The same vital element is abstracted in the one case as is abstracted in the other. I feel no doubt whatever that those cases struck by lightning are instantaneously and completely deprived of animal electricity, and the function of vitality ceases at once. Influenza is only a modified form of this very phenomenon. The one is instantaneous and complete; the other is gradual, imperceptible, and incomplete, fortunately affording an opportunity, at this important and critical juncture, for the prudent surgeon to step in, and by the employment of wise and well-considered treatment, to fan the flickering flame of life; to steady it until nature rallies, reaction is established, a life is saved.

3*d*. *The Treatment of Complicated Influenza.*—In a practical point of view, this question demands from us a more careful consideration than any other. I entreat you to favour me with your serious and particular attention as we approach this division of my subject. The very life of our patient depends upon our correct diagnosis. There are many cases that require all the practical ability and enlightened judgment we can exercise to clearly comprehend them. The young or over-confident practitioner may think differently; but experience and close observation will show him how greatly he has erred. How much I wish I was endowed with a stronger intelligence, that would enable me to clear away all the mists that surrounds this part of my subject. In a former part of this paper, I have endeavoured to lay down some landmarks as distinctive symptoms, to guide us in form-

ing an opinion. To correctly understand nature's processes is infinitely more difficult than the action of human machinery. I will presume that we have decided in our own minds that our patient is one that comes under the denomination "complicated influenza;" that is, the influenza has located itself in some vital organ, and has assumed a subacute malignant type. Now comes the question, What is the best treatment to be adopted? I ask you—every member in this room—for your best advice. I contend it is the duty of every one of you to impart the most useful information to his fellow-member. Let us make the inquiry, first, Is venesection, or vesication, indicated? The impression upon my own mind is that they are not. The conclusions I have formed during a pretty extensive experience—a life spent amongst large plethoric horses—is that nature will not tolerate coercion; that she can repair damages much better than we can do; she does it in less time, and does it, too, more effectually; that vital force has a greater curative power than any of my remedies possesses; what she does, she does it spontaneously, if we will only give her fair play.

Bleeding.—My experience has satisfied me that it is dangerous to bleed in these cases, even if done cautiously. If it does not entail fatal consequences, we have a protracted convalesence; but upon this point, I invite your opinions.

Counter-irritation.—I will take it for granted that no one will advocate severe blisters extensively to the throat and sides in these cases. But in condemning blisters, I must give a reason for so doing. In the first place, I create a supplemental or additional inflammation—doubling the constitutional disturbance, driving the blood with increased fury through the system, especially through the diseased organ, helping to exhaust it and break down its structure—thus contributing irreparable damage. I am, in fact, stirring up the very embers I am so anxious to extinguish. Hence the mischief, and why I contend it is a most reprehensible practice; but besides this, we have the serious sympathetic disturbance from the absorption of the fly. But as to the stimulating effects of a mustard application, employed in moderation, to the throat and sides, in some cases, at a certain stage, I am convinced it is attended with most beneficial results. It appears to rouse the dormant energies of nature, and disperses the tendencies to congestion. Then comes the question, What is the best time to apply it?—at the earliest moment, or the next day?—how frequent?—is it most advantageous to apply the hot-water rug over the sides before or after the mustard? These are questions that I invite you to assist me in answering and correctly deciding. My friend, Mr Lawson, informs me his success in these kind of cases is greater when he employs mustard more generally, and applies it in the early stage. The other day I saw a horse in Mr Mavor's place, London. They had applied a mixture of mustard and linseed-meal, spread upon flannel, and then laid it upon the clipped sides. This was done within half an hour from his first

coming into the place. Mr Mavor informed me this was their regular custom when they suspected the disease locating itself in the chest. He also spoke very highly of the steam-bath to the sides; this, I think, cannot be too highly valued in this kind of cases. Sulphate of magnesia is very highly extolled by many eminent practitioners, in 4 oz. doses twice a-day, as a febrifuge, alterative, and purifier.

Setons, Rowels.—If we insert a rowel or a seton in these kind of cases, we shall find that they will not suppurate kindly; an angry, unhealthy inflammation is set up, causing much mischief from sympathetic fever, and this is followed by deep and extensive sloughings. Occasionally it has been found necessary, not only to take out the seton or rowel, but to soothe the parts by fomentation, scarification, &c.; and instances are not uncommon in which the very life of the animal has been sacrificed by their injudicious use.

Therapeutics.—My mode of procedure is very similar to the plan I adopt in simple influenza: keep my patient's head tied to the open door day and night; administer stimulants and tonics. I have heard iodide of potassium, also chlorate of potass, extolled, but I cannot speak of its utility. Upon this subject I invite you to give me your opinions. Diuretic medicines have undoubtedly considerable power in removing œdema and other deposits, but they have no power in resisting or arresting the process of effusion and exudation; yea, contradictory as it may appear to many of you, I am inclined to the opinion that, if the real truth could be fully known, it would be found that effusion is actually facilitated during the action of diuretic medicines. This we do know, that during the action of cathartic medicine—which is abstracting the watery parts of the blood by way of the bowels, the same as a diuretic does by way of the kidneys—that during the cathartic action the process of effusion goes on more rapidly. Now, it has frequently occurred in my experience, that a patient shall rally up to a given point, and then become stationary for several days, the pulse standing at 60, 72, or 80. The symptoms, taken altogether, do not indicate that my patient is progressing or yet retrograding, but still neither the accelerated breathing nor pulse settles at all. In a few cases this is purely referable to weakness; but if the secretions and mucous membranes are unsatisfactory, this is an ugly symptom. In all such cases it may be taken for granted that the disease is drifting onwards, making insidious advances, is steadily on the increase. In this stage the bowels are always sluggish and unsatisfactory. Now, without for one moment underrating the importance of attending to this point, it is of the utmost consequence to act judiciously, for an error made now throws all the chances against him. Two drachms of aloes, or eight ounces of oil, given now, especially if the stomach and bowels are, comparatively speaking, empty, is sufficient to kill the largest and best horse alive; the aloes get into the system, and act as a deadly poison, or else their action is followed by constipation. I rely upon enemas, frequent

draughts of cold water; and, if he is eating moderately, I may give 1 drachm of aloes, or ½ drachm of calomel, or 2 oz. linseed oil; this will often be found quite sufficient for all purposes. Under such circumstances we can make no progress until the bowels are corrected. I frequently make a change in my tactics—perhaps other practitioners do the same—but I wish to call your attention to this point particularly. I have found the pulse getting quicker and quicker daily, in the face of camphor, belladonna, and other sedative medicines, given twice or four times a-day; but upon me discontinuing this plan of treatment, and administering stimulants and cordials, the pulse has at once commenced receding, and has continued to do so until my patient has entirely recovered. But after all, it is a fact, and will continue to be a fact, that a great number of these kind of cases die whatever you do; and when we discuss this question, it would be well if gentlemen would not let the idea that the admission of a few unsuccessful cases implies a discredit, and instead of which he gives his unvarying success as an excuse for not knowing what *post-mortem* investigation discloses, this sensitiveness operates prejudicially to the success of these associations, and is inimical to the cause of truth. I frankly admit I have had numbers of dead ones—some placed under my care in the last stage, others at the earliest moment—but to all I exercise my best judgment, and employ what I conceive to be the best remedies. I repeat, these discussions should lead us to adopt the most successful treatment. Although it is very encouraging to prove by statistics that the rate of mortality is often in a proportionate ratio to the proper sanitary regulations; still, however perfect that may be conducted, it must never be forgotten that neither man nor horse was intended to be a permanent sojourner here, but was born to die.

3d, *The Treatment of Influenza.*—I now approach the most interesting division of my subject. If the horse is observed just as he is in the act of contracting the epizootic, and when in this incipient stage proper remedies are at once employed, it will be found that it is only an ephemeral disturbance. In such a case I am very fond of administering a pint of warm ale, with a table-spoonful of powdered ginger, and the same quantity of powdered anniseed. The effect produced is so satisfactory in nearly every case, that it would appear to be the very stimulant required at the time. Any diffusable stimulant that acts as an excitant—even brisk exercise, or considerable friction on the skin—is of great benefit. Get the skin thoroughly warm, supply him with cool fresh air, and you have a reaction immediately established; the progress of the affection is arrested; the system seems to assume altered electrical conditions. I do not say that this plan neutralises the invisible influence which is exerting itself from without, but I contend it excites and maintains an artificial spirit and vitality, which enables the system to withstand the shock it has sustained in the loss of electricity, until the process of equilibrium or systematising is being completed. If some hours have

elapsed, and the vascular system has become involved, I administer spirit. nitrous ether and tincture pimento, 1 oz. each, in 4 oz. warm water, every six hours; or spirit nitrous ether and sig. ammonia acetatus. Keep his head tied to the open door. The legs and feet, generally speaking, are hot and tender, they will keep themselves warm, and the simple pressure of a bandage will produce pain; it will be found that there is only an occasional case that requires bandages. Always take care to regulate the quantity of clothing to the state of heat of the skin. You may produce very great mischief by smothering the skin with too much clothing: you will increase the fever, and cause your patient to commence blowing. I am convinced there are some circumstances in which our patient cannot tolerate diaphoreosis. In most cases I remove all the shoes; if my patient has pumiced feet, of course I do not do so in his case. If the pain in his legs is considerable, I may put them in warm water, use arnica lotion, and even poultice the feet. In the worst cases I have found great relief afforded by putting on patten shoes, and thus raising the heels of the feet. There are some cases that do better with carbonate of ammonia and pulb. ginger, ʒij each, every six hours. It is necessary to watch its effect; and it must be discontinued after a certain point is gained. After a few doses, we shall perceive that the salivary glands have become acted upon, and I have no doubt the glandular system generally throughout the body is more or less stimulated by it. It is a beautiful stimulant to the nerves of the stomach and the chest; it does not nauseate, but will produce a nice pultaceous state of the bowels, and cleanses all the membranes. If continued too long, or given in too large doses, it will produce purging. I verily believe we can accomplish everything by it that we can accomplish by calomel, excepting nausea and salivation. Where the fever runs very high, pulse 88 or 92, I may give the extract of belladonna, 1 drachm, twice a-day. I never give my medicine in the form of drink, if there is any soreness of the throat—it is a most reprehensible practice. In most of these cases it is advisable to give an enema twice a-day. In some cases of unusually thick coats I have had my patient clipped, with almost magical beneficial effects. As to diet, I give cold water to drink, one quart every hour; or he may have bran-tea, hay-tea, linseed-tea, rock salt left in his manger, malt mashes, Swede turnips, carrots, oat-straw, with the oats in it, and plenty of wild mint in it, fresh grass, &c., or a little sweet hay. I do all I can to keep my patient taking a little food.

It will be gathered from what I have advanced, that in a vast majority of successful cases, it is to the secret processes of nature, in my opinion, and not so much to the action of medicine, that the credit belonged. And as I view the beautiful theory of health and disease, this conclusion is irresistibly forced upon me, that man, in his short-sightedness, his vanity, and selfishness, has never sufficiently comprehended and appreciated that great fundamental truth, that *Nature is* ever a wise economist—that she does all things well.

References to Mr Owles's Letters, with additional Remarks on his Case of Lameness of a Horse. By JOSEPH GAMGEE, Sen.

HAVING said all that I deem it really necessary to say about Mr Owles's case, I should have let the discussion close with his letter of the 5th of June, published in the *Edinburgh Veterinary Review* for the current month, but for the possibility which would have been incurred, of my silence being construed into consent, and veterinary science prejudiced by the compromise.

It does not appear to me, from the tenor of Mr Owles's last two letters, what he requires me to say, or do; I will therefore return to the origin of the correspondence, and reconsider his first letter, which accompanied the morbid specimen, as he said, for my "inspection and use."

Meanwhile, I beg to explain that at the latter end of April, when I had written my remarks on the case, I was called on a professional mission to England, and, not having had the opportunity to revise my notes, some mistakes escaped notice, especially in the last paragraph, in the second line of which, instead of "fractured" "protracted" was the word intended to express my meaning. Thus, instead of rheumatism being the cause of the swollen pasterns, I believe that that condition was due to protracted injury to the bones and tissues below; and that in all probability, at the latter stage of the case, purulent infection of the blood set in, as a consequence of those fractures, and the unhealthy state of the navicular bone, which I discovered and described.

As the letters, replies, and rejoinders on the matter have to a great extent confused the whole bearing of the case, by mixing up with it much that is irrelevant and foreign, it may be well to requote Mr Owles's own words, which show, that it was to myself that the specimen and account of it was sent, from Aldershott, on the 7th of April—all of which was given in the May number of the *Review.*

Mr Owles says, in his letter addressed to the Editor—

"In a letter which you published in your journal for May 1864, commenting on Professor Gamgee, senior's, paper, which appeared in the previous number, on 'Chronic Lameness of Horses,' I stated with regard to navicular disease, that *I do not expect to find ulceration of the bone internally as the cause or first condition of the disease;* to which letter Professor Gamgee appended some remarks, and also invited investigation, with the view of dispersing the fallacy of old notions. I therefore trust to be excused if I briefly revert to the subject. I have despatched a navicular bone, with the portion of the flexor tendon which passes under it, to the professor's address, *for his inspection and use.*"

Mr Owles continues: "In the specimen sent, the tendon at the surface next the bone presents the appearance of having been gnawed by mice; and was, I doubt not, the part first affected, which, when sprained, having some fibres ruptured, as this tendon had, gives to

my mind the reason why this disease proves so incurable. . . . . A horse may be sound one day, with a foot apparently healthy, and the next day lame from navicularithetis, never again to be sound; such, in fact, was the case with the one from which the specimen was obtained." Having read the foregoing, and recognised the morbid character of the specimen sent me, I perceived that no enviable task devolved on me; as it was quite evident that the sender knew nothing of the pathological character of the bone and piece of tendon sent.

The account given of the case so ill accorded with what I was beholding with my own eyes, that I wrote and asked Mr Owles for more parts of the diseased foot, and, if attainable, of both fore feet; I also submitted a series of questions, and afterwards received the pedal bone of the foot to which the navicular bone and small piece of tendon sent me, belonged; and the answers to my questions related "that the horse was rising eight years. . . . . Had known him for about three years before his death in January; he had fair action, but not high; he had never been lame during the time I knew him previously, and was not infirm. The cause of the lameness is not known; it was sudden."

After I had received, in accordance with my request, these additional details, I again wrote, submitting to Mr Owles that his last account of the case did not agree with the first, which said that the subject was that of "a horse sound one day and lame the next, never again to be sound." By Mr Owles's first letter, I was asked to look at an accompanying specimen, which had given rise to sudden, and, it was inferable, recently occurring lameness; recent, unless the writer holds the notion that structures undergo no change, though injury and suffering be kept up from June 1862 till January 1865; therefore, when I read his second letter, and found that some dawn of the correct light was being thrown on the matter, I asked Mr Owles to reconsider the subject, and whether he would have me send his letters back that he might correct them; stating at the same time that, though I would make comments on the case, he should furnish the history of it. To these hints Mr Owles replied shortly: "The horse had never been lame since I knew him previous to June 1862, when the foot lameness commenced, and I did not see the case till two weeks after the attack."

From the morbid specimens I found that a case of chronic, complicated disease of the foot was presented to me, bearing evidence of progressive changes in the form and constituent character of the two bones, phenomena of prevalent occurrence, as I had shown in my paper in April 1864. The fractures of the bone, too, which Mr Owles in his hurry, or through some other cause, had omitted to see, were amongst the sequences of protracted and unrelieved foot disorders, to which, in several of my published papers, I have drawn attention; therefore, though I saw at once that Mr Owles had placed *himself in* the position of the piper, who went to a place to hiss and

came away hissed, yet I gave to the case all the attention which the time at my disposal admitted of.

As other calls on my time will prevent me from returning immediately to the further discussion of this subject, I will briefly notice some passages of Mr Owles's letters, published and partly referred to in the June and July numbers of the *Review*.

In his letter of May 5, page 300 of the *Review*, the writer says, "Up to the time of his becoming lame, in June 1862, when he was only five years old, he had free action, and showed no symptoms of being infirm. . . . . And had only just finished his training." For training, I read breaking, as it is not shown that the horse had been prepared to race.

Mr Owles then asks—"Did the fractures occur at the commencement of the disease, in June 1862, or subsequently to that date?" I have already emphatically answered this question by stating, most assuredly, within a few days only, of the horse's death.

But Mr Owles anticipated my answer by supplying one for himself, and says again, "This horse was affected in June 1862 with sudden *and permanent* lameness," [why permanent? all states are so until the causes are removed, and restorative measures adopted;] "therefore, I think the fractures and other diseased conditions . . . . resulted consequently upon the injury which produced the lameness at that time."

I need scarcely apologise for my own simplicity in not rightly estimating the actual state of knowledge on veterinary pathology. It had never, I confess, entered my mind that any man who had made the animal economy his study, could have entertained the notion of the conditions in which I found the specimens to have remained in *statu quo* for two years and eight months. Though I assigned a few days as the utmost that could have elapsed, from the time the navicular bone gave way to that when death took place spontaneously, or otherwise, still with that limit I allow that the extent and rapidity of change was influenced by the way the horse was managed. If kept tranquil and soothed, changes for the worse would be relatively slow, even if the conditions were not improved; whereas, if the slightest exertions were given to the foot, or feet, the parts would be torn up, with a rapidity proportionate to the violence used. Under these various aspects, and without seeing more of the horse than the two diseased bones, one of them fractured, I should pronounce that, to the best of my belief, the navicular bone had been broken at least ten days before the horse died, and not over thirty.

In the sound state of a horse's limb, I believe it would be impossible for him to fracture the navicular bone by the exertion of his innate force; but when diseased, and after two or three years progressive wasting and change of structures, it is not possible to say how little exertion might not do it. Pain is the monitor which prevents the more frequent occurrence of fracture in that bone than takes place; though it is of much more common occurrence than

has been known. Mr Owles's horse not having worked in the knacker's cart, or otherwise, would not bias my opinion; because a stroke of the whip, with the effect of making the horse spring suddenly from a lying posture, would be quite enough to cause the breaking-up of a diseased and fragile bone.

I regret my inability to accept Mr Owles's challenge to go into the difficult question of rheumatism. I would moreover do so if I understood that we veterinarians could throw light on that subject by means of chemical analysis, microscopic observations, and practical experience devoted to the horse in the way Dr Garrod and other physicians have prosecuted their researches in men. In the meantime, I am of Mr Dyer's opinion, who says—"I have always thought the term rheumatism a most convenient one, and well calculated to shield us from the hard hitting we may sometimes meet with, when we are unable to show the precise spot where pain exists."

In conclusion, while I am opposed to the custom of assigning fictitious names to unknown diseased states of horses, I in no way desire to check investigation or of giving new descriptions; but I wish to see distinction drawn between words and things. Tell men that these are the same, cram them with words, parrot-like, and they will seek no more.

The Veterinary Review and Stockowners' Journal.

THE ALBERT VETERINARY COLLEGE.

WITH the issue of this number of the *Review* the period of our editorial career in Edinburgh will close. Out labours must be continued in the south. The transference of the New Veterinary College to London, under the highest auspices, is no longer amongst the things probable, but amongst those finally decided on, and to be instantly carried out. All that remains to be done is matter of detail, requiring but few days for its completion, and this journal must henceforth record the events connected with our institution as it grows and thrives in the metropolis. A veterinary periodical, no less than a veterinary college, must be viewed as national in character, and destined to disseminate its influence even beyond the British isles. It is therefore not of much importance that it should date from one city in preference to another, and our readers will doubtless welcome its monthly delivery from the south as much as from the north. We shall strive, at all events, to secure this by aiming at progress, and not adopting the retrograde policy of those who preach and do not practise—who only chatter about union, and go so far as to cut off their noses to spite their faces. We have too much respect for our profession to believe that its members can be led by mere clap-trap and empty words. It is work of the best and most enduring kind, the increase and diffusion of sound knowledge, the inspiration of a sound and rational enthusiasm, with its inevitable attendant *esprit de corps,* which can alone serve us; and without professing unbounded love for all, we hope to strengthen the party with which we have identified ourselves. What that party is, the reader of the *Review* must know. We have worked steadily with those who have had some spirit of independence, who have advocated and fostered the reunion of our divided body into one, and who cannot defend the sordid and selfish conduct of men who would sacrifice every one and everything for their own purposes. We confess our-

selves to be in open and determined antagonism to those whose deeds and words are not such as to elevate our calling in the estimation of mankind, and who throw dust in the eyes of the simple by empty dreary articles on anything but useful practical subjects.

So much for our policy as journalists. Our duty in connexion with the Albert Veterinary College is, so far as we understand it, to further by all means in our power the cause of veterinary education. That this has been done for the past is testified by work done, and by the character of the staff with which we are associated in London. That staff is numerically larger than that of any similar institution in this country, and we do not consider that there is a single individual included on it who requires words of commendation from us. Our colleagues are known already as sound teachers, and as men whose sole desire is to benefit the students that assemble around them. Preparations on a large scale have been made to render the winter session of 1865-66 a memorable one, and we have every confidence in all efforts being duly appreciated by those for whose direct benefit they have been made. One thing is certain, that all that has yet been done, and all that has been planned for early execution, is on a scale to place the Albert College in a position second to none amongst the veterinary institutions of Europe. This is undoubtedly not more than should be expected in the largest city of the world, where all grows, where resources are infinite, and all is progressing, save, as yet, the humble institutions devoted to veterinary science, which cannot be regarded by any unprejudiced person as at all such as they should be in the United Kingdom. It is to fill a gap that we were asked to move southwards. The desires of many have now been fulfilled, and future success cannot be regarded as a mere visionary probability. When an institution most needed starts under the highest patronage, with an adequate amount of capital, and a strong body of men experienced in their work, there can be little doubt of the result. Our motto henceforth implies something more than the one of the Royal College. The words engraved on our seal and banner are pregnant of meaning, though they form the brief sentence—

"SCIENTIA ET INDUSTRIA."

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF THE COUNCIL.—HELD JULY 5, 1865.

Present:—The president, Professor Spooner; Messrs Broad, Brown, Burley, Field, Hunting, Lawson, Lucas, Moon, Robinson, Silvester, Wilkinson, Withers, and the secretary.

The minutes of the preceding meeting were read and confirmed.

The election of a member of council in the room of Mr E. Braby, deceased, was then proceeded with.

Mr Lawson begged to propose Mr James Broad, of Paddington, as a member of council.

On the ballot being taken, Mr Broad was declared to be duly elected.

Communications were read from the several gentlemen who had accepted the office of vice-presidents, to which they had been elected at a former meeting of the council. Mr Burley also acknowledged the honour of his election orally.

A letter, addressed to the president, was then read which had been received from Sir G. Grey, enclosing a copy of a note addressed by the Austrian ambassador, and also a copy of the programme of the Veterinary Congress to be held, in August next, at Vienna, in which a hope was expressed that Her Majesty's Government would appoint delegates to represent this country, and that Sir George Grey be informed whether the Royal College of Veterinary Surgeons wish to send a representative to the Congress.

After considerable discussion, it was moved by Mr Robinson, and seconded by Mr Silvester—"That the Royal College of Veterinary Surgeons have no wish to send a delegate to the Congress at Vienna."

It was then moved as an amendment by Mr Hunt, and seconded by Mr Broad—"That the secretary be requested to communicate with Sir George Grey, stating the willingness of the council to nominate gentlemen fitted to act as a deputation to the Veterinary Congress to be held at Vienna, provided that Government determine upon being represented."

The original motion, having been put from the chair, was negatived, and the amended resolution carried.

A letter was also read by the secretary which he had received from the solicitor to the estate of the late Captain Randall, of Lower Tooting, Surrey, who had bequeathed unto the "Royal Veterinary College, London, the sum of one thousand pounds consols," desiring to be informed whether the corporate body made any claim to this bequest.

After some discussion on the subject, and a letter of explanation had been read by Professor Spooner in reference to the legatee, it was moved by Mr Brown, and seconded by Mr Moon—"That the secretary write to the solicitor, informing him that the council of

the corporate body do not put in any claim to the bequest of Captain Randall to the Royal Veterinary College."

An amendment was then proposed by Mr Withers, and seconded by Mr Wilkinson—"That the solicitor to the College be consulted as to the legacy left by Captain Randall to the Royal Veterinary College, London."

The amendment, having been put by the president, was negatived, and the original motion carried.

The secretary reported, that at the several meetings of the Court of Examiners held in London, thirty-three members were admitted from the Royal Veterinary College, and nine rejected. That twenty-nine members were admitted from the veterinary colleges, Edinburgh and Glasgow, and eight rejected.* The names of the members admitted were read, those who were rejected, and also the names of the examiners and *ex officio* members who were present.

The registrar reported the following deaths:—viz., Mr William M'Kenna, of Belfast; diploma dated January 6, 1835. Mr Edward Braby, a member of the council, and treasurer of the Royal College of Veterinary Surgeons, London; diploma dated August 6, 1833. Mr William Henry Webb, of Thurlow, Suffolk; diploma dated June 1, 1842. Mr George Kirkham, of West Derby; diploma dated April 21, 1843. Mr Francis Cotterell, Royal Artillery; diploma dated May 14, 1851. Mr Adam Hampson, M.R.C.S., of Bolton-le-Moors; diploma dated May 23, 1850. Also, recently, Mr Gavin Clarke, of Limerick; diploma dated August 11, 1847. Mr Edward Darlington, of Armagh; diploma dated May 19, 1852. Mr James Rogerson, of Garstang; diploma dated January 22, 1827. Mr John Hopkins, of Mildenhall, Suffolk; diploma dated May 2, 1861; and Mr John Lythe, *half-pay*, Ordnance; diploma dated October 8, 1805.

The letters of correspondence in connexion with the secretary of the Scotch Section of the Court of Examiners were then read.

It was moved by Mr Wilkinson, and seconded by Professor Spooner—"That the secretary of the Scotch Board be requested to furnish the council with the names of the pupils holding the Highland and Agricultural Society's certificate, who had presented themselves at the recent examinations, and had been rejected by the Scotch Section of the Court of Examiners." Carried.

The secretary laid on the table a work on Parasitic Diseases, by Professor Simonds; also the last edition of a Toxocological Chart, by

* In the above report it appears that from the Royal Veterinary College, St Pancras, out of forty-two students examined, nine were rejected; and that the three veterinary schools in Scotland altogether, including three old practitioners, furnished to the board thirty-seven candidates, which, according to the course pursued with the London College, by analysis, stand thus:—From Professor Dick's College, fourteen students, of which nine were passed and five rejected. Old practitioners, formerly pupils at the same college, three candidates—all passed. From the New Veterinary College, Edinburgh, fifteen candidates—fourteen passed and one rejected. From the Glasgow Veterinary College, five candidates—three passed and two were *rejected.*—ED.

Professor Morton, both of which were presented to the library of the College.

It was moved by Mr Wilkinson, and seconded by Mr Moon—"That the thanks of the meeting be given to those gentlemen for their kind contributions." Carried.

A letter was read, which had been received from Professor Morton, thanking the council for the confidence placed in him in reference to the specimens of drugs which he had laid before the students at the late examinations. He was glad to learn that the plan had also met with the approval of the members of the Examining Board to which he was attached. He now begged to present to the Royal College of Veterinary Surgeons those specimens as a nucleus for a collection of articles of the materia medica, expressing a desire that a fitting place be appropriated for their reception, that they be put in suitable bottles, and placed on shelves, with enclosed glass doors, in the library.

It was moved by Professor Spooner, and seconded by Mr Wilkinson—"That the thanks of the meeting be awarded to Professor Morton for his liberal contribution—that a suitable place be made for the reception of the drugs as suggested, and that Professor Morton's letter be entered on the minutes." Carried.

It was moved by Professor Spooner, and seconded by Mr Wilkinson—"That a book, entitled 'Oliphant's Law of Horses,' be purchased, as a work of reference, for the use of the library." Carried.

A letter was then read from Mr Bushman, veterinary surgeon in the United States' Government service at Giesboro', Washington, who had unfortunately lost his diploma, and now applied for a duplicate. He informed the council that he had advertised, and offered large rewards for its recovery, but without success.

After some little discussion, it was moved by Professor Spooner, and seconded by Mr Lawson—"That a similar certificate be granted to Mr Bushman as had been previously given to a Mr Hickman, who lost his diploma during the Indian Mutiny, and that it set forth that Mr Bushman is a member of the Royal College of Veterinary Surgeons." Carried.

The secretary laid upon the table three portraits of Professors Morton, Varnell, and William Robinson, Esq., which had been presented to the council by Messrs Harding & Co., artists and publishers, Southampton Street, Strand.

It was moved by Mr Wilkinson, and seconded by Mr Coates—"That the thanks of the council be conveyed to Messrs Harding & Co. for the same." Carried.

The report from the Finance Committee, and the quarterly balance sheet of the treasurer's accounts, was submitted. The current expenses for the quarter amounted to £64, 3s. 5d., which they recommend should be discharged.

It was moved by Professor Spooner, and seconded by Mr Robinson—"That the report and the treasurer's quarterly balance sheet be received and adopted."

Cheques were ordered to be drawn for the current expenses.

The reappointment of committees for the year was then proceeded with.

The Finance Committee to consist of Professor Simonds, Messrs Wilkinson, Moon, Harpley, Harrison, and Field. The House Committee to consist of Professor Spooner, Messrs Mavor, Withers, and Harrison. The Parliamentary Committee to consist of Professor Varnell, Messrs Ernes, Mavor, Moon, Harpley, Harrison, and Lecker.

By order of the council.

WM. H. COATES, *Secretary.*

MISCELLANEA.

(*Commented on by* JOSEPH GAMGEE, Sen.)

UNDER the above designation our contemporary adopts a second-hand paragraph, as the medium of a gratuitous announcement of the approaching transfer of the New Veterinary College from Edinburgh to London. And but for indulgence on the part of the editors in the use of untruthful phraseology, and the absence of rational sense in the attempt, we might follow the example of the late Mr Hunt, M.P., of Reform days' renown, who sent a parcel of his best blacking to another Hon. M.P., because that gentleman had spontaneously proclaimed to the House the line of business he (Mr Hunt) followed; and we are similarly disposed not to let a turn done go unrequited.

The editors of the *Veterinarian* adopt the following:—"A few years back another Veterinary College was started in Edinburgh, and with so much success that this is now coming to London." Then, in a round-about way, the writers allude to a report, real or imagined, that the late President of the Royal College of Veterinary Surgeons was contemplating giving the weight of his prestige to the younger and more advancing institution; in doing which, say they, it would be "cutting off the branch upon which he was sitting. It was simply idle to say that these two schools would not be antagonistic. We might as well have two Royal Colleges of Surgeons."

Before I attempt to show these writers, who, to use their own words, "appear to have been rivalling the mole-eyed woodman," I may tell them that I shall not suppose them so destitute of common sense as the passages to which references are made would indicate; I have, therefore, only one other alternative to fall back upon,—that of regarding their misdirections as wittingly given. "We might as well have two Royal Colleges of Surgeons." But are the Royal Colleges of Physicians and Surgeons places where medicine and surgery are taught? or are they not the governing institutions for the two chief divisions of the medical professions? And are not all the

medical schools of London, and throughout England, tributaries to those centres of honour, to which all must go to be examined, and to have their status assigned, before they can enter an ennobling profession? And "these two schools" stand in the same relation to the Royal College of Veterinary Surgeons in Red Lion Square, as, probably, two hundred medical schools, spread over the kingdom, stand towards the examining boards in medicine and surgery. About the "branch upon which the president was sitting," I beg to refer to a less generally known circumstance than the well understood facts just alluded to—viz., that but for the New Veterinary College, and the unceasing perseverance of Mr John Gamgee, the Royal College of Veterinary Surgeons would have afforded but a very slender branch for any president, at this time, to sit on—hardly a twig, in all probability—when it is taken into account that, ten years ago, England had one Royal College of Veterinary Surgeons, and only one Royal Veterinary School to supply its examining board with students for examination—and that one school held the Royal College of the profession subordinate—the latter depending for resources, and the former threatened to cut them off. The professors of the school all presided at the council board of the college, and therefore ruled by outvoting and threatening; while the one Royal College and the one insubordinate school resembled an army composed of one commanding officer, and one lame, ill-disciplined soldier.

Through the originator of the New Veterinary College entirely, our Royal College of Veterinary Surgeons has become comparatively flourishing; its resources have probably been doubled within the last eight years, with brighter prospects opening; and four schools now send pupils to the Examining Board of the Royal College of Veterinary Surgeons, where something like discipline prevails. Thus there is not one "branch" only for "the mole-eyed woodman to sit upon," but there are four branches, and all tributaries to the system.

A word for the older of our schools, to which we turn with a veneration something akin to that of the dog for the kennel, where little had been conferred to touch the senses deeper than the instinctive. The Old College has always thriven on quick returns; fresh pupils, with accompanying fees, to pass quickly, keep the secret, and ask no questions—such has been its motto. Illiberality, jealousy, and despotism have been the ruling characteristics from its early history—imparting little, and insolent when asked for more; consistent only in persecutions, where independent thought seeks its useful application.

As one item of positive evidence is more to the purpose than any number of words, I will adduce a specimen, one of many, to show the way things are managed at St Pancras.

Ten years ago the following note and resolution came into my hand, and, though not addressed to myself, being very deeply concerned, I kept it, thinking that posterity might learn something of the history of the time out of it. The individual to whom the note was

addressed had then recently visited some of the principal veterinary schools on the Continent of Europe, at each and all of which the utmost courtesy was shown. Their museums were opened, dissecting rooms, chemical laboratories, and every facility were afforded to enrich the mind, besides affording material for note-books and drawing-portfolios. On his return to London, having had access to the British and Hunterian Museums, the desire was evinced to take some drawings from the specimens in the Museum of the St Pancras Veterinary College, to which all of us had in time past contributed, and where specimens had been many years accumulating, with no opportunity afforded to make them of use. When application was made, the answer returned was the following:—

July 27, 1855.

DEAR SIR,—I beg to inform you that your application, as made to me by your note of the 18th inst., for permission to take drawings from the specimens in the museum of the Royal Veterinary College, was laid before the meeting of the governors of the college, held on Friday, the 20th inst., when a resolution was passed with regard to it, which resolution was confirmed by an adjourned meeting of the governors, held on Thursday, the 26th inst., and of which I herewith take leave to transmit to you a copy.—I am, dear Sir, very faithfully yours,

CHARLES SPOONER, *Principal and Secretary.*

To Mr JOHN GAMGEE.

Copy of Resolution.

"Resolved, that Mr John Gamgee's application for permission to take drawings from the specimens in the museum of the college cannot be complied with."

I need not say that appeal to the governors is the subterfuge commonly resorted to by which refusal is enforced. How many governors there are amongst the noblemen and gentlemen of England who would recognise any share of their own in the above or any analogous act, I will not pretend to state—few, if any, no doubt.

These principals would hunt a young, striving man down, so long as they were protected by governors, until their disreputable end was attained. Happily, however, new vigour and new resources sustained the man determined to work for good. If it were not so, there would be danger of the work of a family being destroyed, by principals cloaked under false colours.

PERISCOPE.

ON CATTLE DISEASE PREVENTION.

When Youatt commenced to attract the attention of farmers and veterinarians to the importance of cultivating cattle pathology, he little thought that, within a dozen years of his first attempts, the whole country would be alarmed by the appearance of the murrains which originally impressed the people of the Continent with the value of veterinary science. The large sums of money annually devoted by Continental states to the support of veterinary schools, and the maintenance of strong bodies of veterinarians, are not regarded as ill-spent, though in London even the two hundred a year voted annually by the Royal Agricultural Society is looked upon somewhat in the light of a superfluity. It is indeed useless denying that very vague and primitive notions have been held here regarding the duties of veterinarians, and farmers are disposed to believe that they can usually do best without them. A sick ox or a sick sheep ill affords a doctor's bill; and, so far as the ailments of individual animals are concerned, it is often more economical to trust to nature, or to bury, than to pay for a cure. So much has this truth impressed itself on the agricultural mind in the United Kingdom, that veterinarians can only live where horses abound; and the appearance in this country of the foot-and-mouth disease and pleuro-pneumonia has tended rather to banish professional men from farmyards than otherwise. We are not astonished. Circumstances have rendered farmers cautious; and while on the one hand they have used their best endeavours to keep clear of disease, they have, on the appearance of any deadly complaint, sought the most expeditious way of getting rid of the stock, and thus secured the most certain method of keeping the secret. With a rate of mortality which is always three, four, and five times greater than it used to be thirty years ago, we hear no grumbling. Farming and the cattle trade have adapted themselves to the present conditions, and every one seems to act on the adage, that "the less said the soonest mended."

A cry, however, is being raised, that calves are not to be had. Lean stock is so dear, that in many districts it is difficult to farm remuneratively. Beef is at an enormous price, and not only are the people complaining, but the butchers declare, and often with great justice, that their profits are seriously curtailed. All this is recognised as constituting an evil, the remedy for which cannot be discovered. The importations of stock are increasing. The Danish government and Scandinavian Agricultural Societies are no longer content to put up with the small profits allowed them by the German Jews, who have been extensive purchasers in Jutland, Zealand, and elsewhere for the London market; and every effort is being made to increase the direct supply of stock for the United Kingdom from most of the fertile pastures of the northern parts of the European continent. Until recently, it appeared as if the foreign trade could not acquire a development at all proportionate to our wants. The present season has somewhat altered the aspect of affairs, though we still fail, and must for long fail, to obtain from foreign lands the quality of beef which our own farmers can manufacture. Higher and higher prices, with greater scarcity of stock, must continue to rule, and there is a prospect of farmers at all events listening to rational measures for their relief. Better late than never. If they have turned a deaf ear in times past to those who have advocated the protection of the lives of their animals, it is probable that they will now earnestly discuss all reasonable proposals; and it is with a view to encourage this desirable change that we venture on this occasion to draw their attention to some points of very considerable importance.

To strike at the root of the evil above referred to, we may state that there has been a strange disregard of the course of events in our breeding districts. Grazing and stall-feeding have been so much safer and more profitable than keeping dairies and rearing calves, that wherever practicable they have been prosecuted with energy. It has not been the business of individual farmers to think of the future supply of stock for such purposes. In some districts they have been tempted with stores from Holland; but farmers in the border counties have had occasion to repent such trials; and we are acquainted with various parts of Scotland to which Irish cattle have been trucked this season, where more than could be fattened were at one time reared. We require more home-bred stock—more cows and more calves from a restricted breeding-ground.

However difficult the solution of this problem may appear to some, we unhesitatingly affirm that intelligent action may yet do much for the farmer and the British public in this matter. With a view to indicate this, we may for the time confine our remarks to three points of importance—

I. The Trade in Cows.
II. The Trade and Transport of Calves.
III. The scope for combining Breeding and Feeding on farms to a greater extent than for the past.

I. *The Trade in Cows.*—No reliable statistics are at our disposal to prove incontrovertibly the rapid rate at which the cows of this country are annually decreasing, from the constant enormous mortality in town dairies. It is acknowledged by all that reckless mismanagement leads to the rapid destruction of animals tied up for the production of milk in large cities. The misunderstanding on the subject, fatal to salutary reform, has arisen from the diseases of animals being ill understood, and that many-headed monster contagion having been ignored. Some persons have attacked the system of feeding town cows—which might be better, and could be infinitely worse; others have spoken of the animals not being permitted to take exercise; and however paradoxical it may appear, a town dairy cow is much safer and healthier, less liable to accidents and disease, if kept tied up by the neck for six months at a time, than if driven about as the cows are in Newcastle, Dublin, and other cities, where freemen enjoy the privileges of common pasture. Pictures have been frequently drawn of dark cellars, too low for a man to stand up in, deprived of any inlets or outlets for pure or foul air, in which the animals can only be seen by gaslight, and where, on inspection, four or five cows are found to be consuming less atmosphere than one would require. All this is very true, and nothing has been lost on the intelligent medical officers of London, who have succeeded in registering the dairies, excluding them altogether from certain parishes, and attending to the purity, cleanliness, and ventilation of all under their control. The paving, drainage, white-washing, and daily flushing, have not, however, affected the progress of pleuro-pneumonia. There has been no diminution of disease as a rule. It is raging now, as it has done more or less for twenty years past; and so long as it continues, so long as the town-dairy system remains as it is, we must have the country drained of the animals it so much needs for keeping up the home supply of animal food.

There are those who believe that which is not the fact—viz., that the country supply of milk for large towns is restricting the number of town cowfeeders, and that the wants of large cities can be fully met by dairy farmers. Admitting that a very large quantity of the milk needed by the towns can readily be forwarded from a distance by rail, it is a well-known fact that the town cows cannot be dispensed with. A retailer of milk in the city of London will pay 2¾d. per quart wholesale for milk supplied by a neighbouring dairyman, whereas he less willingly allows 2d. per quart only for the country milk. This may appear strange; but it is easily explained when we know that to secure the proper carriage of the milk and for the sake of profit, the country dairyman keeps the morning's milk for the afternoon's despatch, and the evening's milk till next morning, so that much of the cream is removed and made into fresh butter, which is readily sold at a high price in all large towns. The town dairyman cannot trouble himself with butter-making, and sells his milk as it comes from the cow, adding, it is true, some water, if he disposes of it directly to the consumer. There are so many advantages, which we need not now discuss, in having an adequate town-dairy supply of milk that we should turn our attention to altering those conditions which lead to the regular wholesale destruction of the fine cows purchased by the cowfeeders.

That our readers may form some idea of the extent to which our breeding districts have been drained for town purposes, we may mention that cows which were sold twenty years ago for £10 or £12, realise now from £18 to £20. It is no unusual thing for a dairyman to give £25 and £30 for a cross shorthorned cow—and in spite of these prices the animals cannot be had. They are rapidly diminishing.

It is admitted that the number of cows kept in many large towns—and we may take as good examples London and Edinburgh—has not increased much during the past twenty years. The number, however, annually purchased in any single town is double and treble what it used to be prior to 1840. We perfectly remember seeing animals in the London sheds that had been one, two, and three years in the hands of town dairymen, on whose farms they were kept for a couple of months prior to calving; but now the majority of these animals are sold diseased to the butcher within

five months of entering the dairy. The town dairyman has learned that a short-horned cow leaves an enormous profit if she only lives four or five months after calving, and he knows that his predecessors in the trade erred in keeping the animals on as long as they did; but he does not consider how best to economise the scanty quantity of stock this country can supply. He goes on buying and killing twice and thrice as fast as his ancestors, quite regardless of all consequences.

Formerly the dairy districts spared for the towns the old cows which had to make room for the young ones; but now the lean animal, with well-defined cheek and facial bones, well-ringed horns, and a dropped udder, is not to be seen. Heifers with their first calf are being bought up greedily; and good fat cows, with their second or third calf, are, as a rule, delivered to the town cowfeeders. Can we then wonder that cows are getting scarce? If we could only prolong the average life of the town-dairy cow from six to nine months, the saving to the country would be enormous; and greater would be the saving if we could adopt a system whereby animals milked from five to six months after calving in a town could be returned in calf to the country. That this is practicable and profitable we hope at some future time to show. For the moment, we are desirous only of indicating that the wholesale destruction of cows in large towns is incompatible with an increase in the breeding stock of the country. Any sceptic on this point can easily be enlightened by a communicative cow-dealer or intelligent town dairyman.

II. *The Trade in and Transport of Calves.*—Presuming that we have shown that there is scope for the exercise of economy in relation to the lives of our cows, we believe we can even more successfully demonstrate that the interests of the farmer and of the people demand a radical change in the manner in which calves are used.

We do not fall in with the cry that indigestible veal should be banished from butchers' stalls, both by the advice of the Faculty and the strong arm of the law. British veal, if we except the flesh of the "slink calf" or "staggering bob," has been a rarity which gold has usually failed to purchase of late. The greatest consumption of well-fed veal in this country takes place in the metropolis; and whereas formerly the farmers of the counties of Middlesex, Surrey, Essex, Cambridge, Lincoln, &c., supplied their fatted calves at remunerative prices, the London veal trade is now gone entirely into the hands of the foreign trader. From Antwerp and other parts many fine calves are imported; and animals that have never tasted milk or food of any kind cannot well compete with them.

The treatment of calves in this country is often cruel, revolting, and recklessly extravagant. Thousands of them are born where they cannot be reared, either in country dairy districts or in large towns. They are not permitted to suckle their mother. Thousands of them die within a few hours of being born, and a far larger number during the first week or two of their existence, from mismanagement in feeding. One great cause tending to encourage this state of matters is the ready sale found for a dead calf with its throat cut, whether it has bled or not. We believe that the proper and humane treatment of calves would be greatly encouraged, and their number enormously increased, if a law were passed that no such animal could be sold as human food unless it had been fed or suckled for at least six weeks. This is the law in many parts of the Continent; it works well, and should be tried here. One effect of such legislation would be securing for the farmer an opportunity of purchasing far more calves at a month old than he can get now.

The practice in town dairies is to give the calf the first milking of its mother and then dispose of it at once. Dealers will give 30s. and 35s. for newly-dropped short-horn calves. We have known farmers in Aberdeenshire this season give £3 and £3, 10s. for newly-born calves in good condition in Aberdeen, and they had then to pay for their carriage home. The mortality has in some parts been enormous, and it is hard to tell what a stock of calves may not cost at present rates. It is singular that, notwithstanding the regular outcry as to the deficient supply of calves, and the frightful mortality amongst them, nothing is done to remedy the state of matters. As a rule, the dealers who buy up in the towns in England send the calves by rail to their destination. Thousands of these young animals travel, crowded in cattle-trucks, for from twenty-four to fifty-six hours without food, and having perhaps tasted milk once, if at all, after birth. As the trucks are shunted and stopped, the little things roll over each other, the weaker succumb, and are trampled on by the stronger. Two or three huddle up together, and one of them may be so squeezed as to die of suffocation or internal injury. No one cares. The dealer cuts the dead one's throat at the station, and the butcher pays from 10s. to £1 sterling for it in-

stead of the farmer getting it at a better price. These are looked upon as the risks of trade; and the demand for calves has been so great of late years, that many have succeeded, in spite of the cruelty, to make money at it.

The calves which survive the railway journeys often die in very large numbers after having been delivered to the farmer. The starved creatures distend their stomachs with any quantity of milk they can get at. The digestive powers of the alimentary canal having been destroyed, diarrhœa sets in, and death soon follows.

If the Society for the Prevention of Cruelty to Animals would lend its influence to put down cruelty to calves, it would do more good than by offering prizes for the painless extinction of the life of vermin. Prizes might be offered for the best railway truck for calves—and we do not see why such a conveyance should not have an apparatus permitting every calf to suck milk from an artificial teat several times daily. The arrangement could be easily carried out, and the expense of feeding the calves on the journey would be amply counterbalanced by the improved condition in which the animals would arrive.

On questions of this kind the interests of the country should be considered before those of individuals. Not fifty per cent. of the calves dropped in the United Kingdom ever live beyond the first fortnight of their existence. No one can dispute this fact; and with scarcity of stock threatening us at present, it behoves all to offer suggestions, and work to discover a remedy. Now, the town cowfeeder grudges a single meal of milk to a calf. He should be looked after, and made to understand that animals are not to be starved, and that rice water, hay-tea, baked flour and water are better than no food at all for the young animals he wishes to get rid of. The calf-dealers specially need looking after as well as the railway companies; and so far as the farmers are concerned, it is undoubtedly necessary widely to disseminate knowledge regarding the very simple treatment required for the prevention and cure of the intestinal disorders so fatal to young animals.

III. *The scope for combining Breeding and Feeding on farms to a greater extent than for the past.*—In the present state of affairs the less the farmer has to enter live-stock markets the better. So many have suffered from the purchase of a single animal which has carried disease home, that greater caution is now exercised than formerly in mixing strange animals with a clean stock. But altogether apart from the danger of infection, the question to solve is, how to produce on the land that which must otherwise be purchased at a very high price elsewhere. There are farms where the breeding of stock would not pay, or at all events feeding would pay so much better that no one would think of breeding; nevertheless we have seen much done under extraordinary circumstances with a little management. There are many grazing and mixed farms where, in addition to two or three year olds, a certain number of year old queys can be kept, put to the bull, and at two years old or upwards each gives birth to a calf, which it has to suckle. These queys, after rearing their calves on good keep, can be fattened in another year; and we believe that, in addition to the advantage of having young home-bred stock needing little addition every year, the queys at three years old will pay better than, or quite as well—always including the price of the calves—as bullocks kept over the same period of time. In times past this might not have been the case, but when a good sound calf may cost nearly a five-pound note very shortly after birth, it is easy to understand that breeding, under the circumstances above mentioned, may be very advantageous.

In relation to the subject of cattle disease prevention, it is evident that the combination of breeding and feeding would obviate the unfortunate results of the ill-treatment to which bought calves are subjected; and from having to buy a very limited number of young animals to make up his full complement of stock, the farmer could avoid large fairs and markets, where diseases are often contracted.

"BREAKING DOWN."

(From the Sporting Times.)

SIR,—In the remarks subjoined to the letter by "A Vet" in your current issue, you say, "Mr Gamgee denies that such a thing as breaking down ever occurs." Though I have often intruded myself on the public within the last three or four years, for the purpose of exposing what I conceive to be fallacies commonly entertained on the construction of the fore and hind limbs of the horse, their true functions and the way in

which injuries occur, which go under the general denomination of "breaking down," with your permission I will now make the *Sporting Times* the medium of a few additional remarks, with the view of affording explanations.

The questions involved are perhaps of too technical a nature to admit of the non-anatomical reader determining for himself, though, with the parts at hand to show, no one fails to see the true state of the matter. Readers may say, then why have not the whole veterinary profession understood it? I do not feel called upon to answer that question, the time has not yet come, it seems, for thorough discussion. Of course these remarks do not apply to those gentlemen whom I had the honour to aid in their course of instruction at the New Veterinary College; nor do I mean to include personal friends, though I am aware that some members, between whom and myself there is no want of mutual esteem, who, not having access to other means of demonstration than my published statements, show reluctance in accepting my views on the construction of the regions referred to. Some have said, "No doubt all Gamgee says is correct, still to give up all that we have learned in our early days is, in fact, like the giving up of our bread and cheese." It would therefore appear, that it is not through any omission of mine that discordance on the subject exists. A little more time would seem to be required before it will be convenient to change opinions. You will, I have no doubt, see various papers of mine, besides any which may have been sent to the *Sporting Times* on these questions. I shall not recapitulate what I have said already, it would exceed the time at command to furnish an essay on the anatomy and physiology of the limbs of the horse as each new form of question arises; in justification of myself in the meanwhile, I may state that as many gentlemen as have asked me for explanations, I have, aided by my anatomical specimens at hand, satisfactorily explained, in so far as half an hour's demonstration can effect that object. On "breaking down" you very aptly say, "The term, though a convenient one, is certainly too elastic in its application." Well said this! Before I published a line about "breaking down," I had worked much, and written to some extent, as well as demonstrated in the lecture-room, to prove that much of what has been called the anatomy of the foot is defective. Such I vouch to be the case, viewing the parts in their physical aspect, but it is only when we come to what is called the physiology, that the absurd notions which have prevailed crowd before us.

On one occasion, when a horse was said to have "broken down"—had sprung his suspensory ligament, I said the thing was impossible. I beg it to be borne in mind, that I had already published my conviction of there being no such structure as assumed, elastic, suspensory ligament; that in fact there was no elongating and alternate contractile property belonging to the broad pliable band placed behind the shank bones, and that the use of that band was of a totally different kind to that attributed to it by anatomists of the horse. I proved that the ligament suspends no part, neither does it sustain any downward bearing, that in fact the injuries called "breaking down," and injuries there are, are due to other causes and actions altogether different to those generally supposed. I have entered into these explanations to show the various means I have employed to establish a true state of knowledge of the component parts of the limbs of the horse, their actions, and incidental derangements. No sentence uttered by me at any time is to be taken as explanatory of this important matter, which it is impossible to treat thoroughly by mere words. I consider that I have done my part thus far, to the utmost of my humble means, and shall continue my course as hitherto, still I cannot by anticipation meet objections, and therefore shall await them. Though my professional brethren may take a long time to think over the matter before they speak *pro* or *con*, spontaneous recognition of my efforts have come to me from men on whose opinions I place the highest value. Amongst these Professor Owen, whose good opinion more than compensates for a host of surface observers. The same may be said of the approving sentiments expressed by the Hon. Admiral Rous. And, lastly, may I be allowed to refer to a passage in a letter which you, Sir, did me the honour to address me more than a year ago? Your letter, now before me, runs thus:—

"Carshalton, Surrey, *April* 30, 1864.

"SIR,—I was much interested by your letter in last Saturday's *Sporting Gazette* on the subject of 'Breaking Down.' I know nothing whatever of veterinary surgery, but it has always struck me as somewhat extraordinary that there should be a *suspensory ligament;* but as everybody much better informed than I pretend to be used the term, I took it for granted that they were correct, and that in the anatomy of the horse there were structures which 'were never dreamt of in my philosophy.'

We hear in human anatomy of the suspensory ligament of the liver, but the only suspensory ligament I know of is the hangman's noose! *Suspension*, so far as I know, is no part of the duty of *ligament*."

I need not say that I attributed due importance to the clear insight exhibited in the above quoted letter, and I still hope that with such capabilities for discerning right and excluding error, that you will lend your powerful aid in the establishment of truth.—I am, Sir, your obedient servant, JOSEPH GAMGEE.

New Veterinary College, Edinburgh, *June* 19, 1865.

ON THE TOOT PLANT AND POISON OF NEW ZEALAND.*

By W. LAUDER LINDSAY, M.D., F.R.S. Edin., Honorary Fellow of the Philosophical Institute of Canterbury, New Zealand, &c., &c.

§ 1. INTRODUCTION.

A. Destructiveness to Flocks and Herds.—In the course of a tour through the New Zealand provinces during the latter part of 1861 and earlier months of 1862, I was everywhere struck by the abundant evidences of the devastation produced among flocks and herds from their feeding on the "toot" plant, one of the most widely-distributed and familiar indigenous shrubs of the country. One settler friend told me of his having lost by "tooting" 250 sheep; another, 80 to 100 sheep of a flock of 400; a third, 7 of 16 bullocks; a fourth, 6 of 24 cattle; a fifth, 24 cattle; a sixth, 6 of 8 cattle—each of these instances in a single night. Another flockmaster lost 400 sheep out of a flock of 2000, 25 being frequently dead of a night. In other words, he seemed a fortunate farmer or runholder who had not lost more than 25 per cent., or one-fourth of his stock, from toot-poisoning; while in some instances the losses were so high as 75 per cent., or three-fourths. Some of the colonists had suffered so severely from losses of bullocks by toot-poisoning, that they were at the trouble and expense of attaching a boy to each of their bullock-teams, solely for the purpose of preventing these animals feeding on this pest of the colony. Such incidents I found were of daily occurrence. I met few settlers who had not had at some period occasion from this cause to mourn the loss of sheep or bullocks—the former sometimes by the hundred, the latter by the dozen.

The illustrious Cook, one of New Zealand's earliest and truest benefactors, frequently bewails in piteous or pathetic language the losses caused among the animals

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* The details given in this paper were mostly collected on the spot, in the form of notes of the oral evidence of various of the oldest settlers of Otago in the middle, and Auckland in the northern, island—authorities on whose veracity and intelligence I could thoroughly rely. My informants belonged to all classes of colonists, and were very numerous. Their evidence was frequently very conflicting, and sometimes apparently irreconcilable; the different results said to be producible on animals by "toot" in the northern and middle islands being particularly striking.

In Otago my information was chiefly derived from the following gentlemen, to all of whom my acknowledgments are due for every species of colonial courtesy, and all of whom I am proud to regard as friends in the best sense of the term:—

1. William Martin, Esq., of Fairfield, Saddlehill, then Member of the Legislative Council of Otago—one of the "Old Identity," or original settlers when Otago was colonised, (1847–8,) who was, at one period of his experience as a pioneer settler, himself "tooted."
2. John Shaw, Esq., of Finegand, on the Clutha, also at one time a Member of the Legislative Council of Otago, and one of its earliest colonists.
3. The Rev. William Will, East Taeri Manse, one of the first settled ministers (of the Free Church of Scotland) in Otago.
4. John Cargill, Esq., of Greenisland, Member of the General Assembly of New Zealand, and of the Legislative Council of Otago, another of the pioneer settlers, and son of Captain Cargill, founder and first Superintendent (or Governor) of the Province.

Of North Island settlers, my acknowledgments are chiefly due to—

1. F. E. Manning, Esq., of Hokianga, Auckland, a "Pakeha Maori" of over thirty years' standing: the first local author of any note; whose historical works on New Zealand are equally well known at home and in the colony. Mr Manning took the trouble to commit his evidence, which is in various important particulars exceptional or peculiar, to writing. (January 18, 1863.)
2. Captain Charles Blewitt, 65th Regiment, of Wanganui, (now in the field in front of the rebel Maoris,) who was my fellow-passenger home from Auckland in 1862, and from whom, in the course of a protracted voyage, I acquired a large amount of valuable information on New Zealand natural history.
3. Robert Stewart, Esq., Member of the Provincial Council of Auckland for the Raglan districts.

he endeavoured to introduce and naturalise by their eating what, I doubt not, was "toot." Speaking, for instance, of Queen Charlotte's Sound, in May 1773, he says—"The ewe and ram I had with so much care and trouble brought to this place were both found dead, occasioned, as was supposed, by eating some poisonous plant. . . . Thus my hope of stocking this country with a breed of sheep was blasted in a moment."

Referring to the same locality in November 1773, and to two goats which he had previously put ashore, he remarks—"I had the misfortune to lose the ram soon after our arrival here in a manner we could hardly account for. . . . They seemed to thrive very well. At last the ram was taken with fits bordering on madness. We were at a loss to tell whether it was occasioned by anything he had eaten or by being stung with nettles,* which were in plenty about the place; but supposed it to be the latter, and therefore did not take the care of him we ought to have done. One night . . . he was seized with one of these fits, and ran headlong into the sea; but soon came out again, and seemed quite easy. Presently after he was seized with another fit, and ran along the beach . . . and was never seen more. . . . We supposed he had run into the sea a second time, and been drowned. . . . Thus every method I have taken to stock this country with sheep and goats has proved ineffectual."

This toot-poisoning is undoubtedly a source of great loss to the settlers, who are mainly dependent on their flocks and herds—on which, indeed, the ultimate prosperity of the New Zealand provinces virtually or mainly depends. In every part of New Zealand I visited I found concurrent testimony as to the ravages of toot. The colonists were unanimous in their assertion that there could scarcely be a greater boon conferred upon them—short of a final settlement of the native *questio vexata*—a greater barrier to their material prosperity removed, than by determining the nature of, and remedy for, the toot poison. So fatal was toot, during the period of my visit to Otago, to the dray-bullocks employed on the road between Dunedin and the Tuapeka gold-field, that the local government gave instructions to the provincial surgeon to insert a standing advertisement in the public prints, warning settlers, and especially new comers, of its abundance, its attractiveness to cattle, and its dangerous properties: indicating the characters of the plant, and instructing them how to protect themselves and their flocks and herds from its poisonous action. The aim of the government, however, could not be carried into effect in consequence of the very deficient and unsatisfactory knowledge of the natural history of the plant then in existence in the colony.

I have every reason to suspect the existence of a similarly deficient or unsatisfactory knowledge of its natural history at home†—if, indeed, the plant is at all generally known as a poisonous one. This conviction or suspicion led me carefully to take on the spot notes of evidence on the action of the plant on man, as well as on the lower animals, with a view to bring the subject under the notice of toxicologists, chemists, botanists, and other scientific men likely to be interested therein at home. All that I am in a position to do in this memoir is to summarise the results of my observations and inquiries in New Zealand, so as simply to introduce the subject, and lead to its full investigation by competent scientific authorities. Dr Murray Thomson, of Edinburgh, now Professor of Experimental Science in the Government College at Roorkee, Bengal, undertook, in 1862, a chemical investigation of the specimens I collected and brought home for analysis, with a view to obtain some accurate and reliable information on the nature of the poison, the laws of its action on the animal system, and the character of its appropriate antidote. His researches were partly defeated, and were finally put a stop to by his translation to India in 1863.

B. Accidents to Man.—Scarcely subordinate in importance to its poisonous action on sheep and cattle is its toxic influence on the human subject. I am not aware of any well authenticated case in which the eating of toot-berries has proved fatal in the adult, though the consequences otherwise have been serious enough; but there are a few cases on record of fatal results in children, generally from eating the tempting berries, which hang in rich racemes on the shrub; though sometimes also from eat-

* The commonest indigenous nettle of Otago, Urtica ferox, Forst., is a bush well deserving its name, abundantly furnished with very large, conspicuous, bottle-shaped stinging hairs or glands, sometimes a quarter of an inch long—the pain of the sting lasting in man four days.

† I have at least failed to find any account of it in our public libraries, while the most eminent of our toxicologists have expressed or avowed their entire ignorance of the existence of the plant or its poisonous action.

ing other parts of the plant. Dr Thomson refers to the death of several children as well as cattle, in the North Island, from eating tutu berries. He may be correct as to the children, but I suspect he is in error as to cattle having been poisoned by eating the berries. While I resided in Dunedin an inquest was held on a fatal case in one of two children, from eating the young shoots of the plant. In another case—a girl—a nervous irritability of a distressing kind was attributed to her having been poisoned by toot several years previously—with what truth, however, there were no data for forming a proper judgment. These toot-poisonings were much more common at an earlier stage of colonisation, when the poisonous properties of the plant were comparatively unknown; and now they are mostly confined to the freshly-arrived immigrants, who, however, in these days of gold digging, form a very large proportion of the population, especially in Otago, to which province my remarks principally refer.

§ 2. BOTANICAL CHARACTERS OF PLANT.

The toot, or tutu plant, is a Coriaria, the C. ruscifolia, Linn. (C. Sarmentosa, Forst.) The plant is variously designated by Maoris and settlers in different parts of the New Zealand islands; and this of itself indicates to a certain extent how familiar is the plant, and how widely and abundantly distributed. The designation I have given above, however, appeared to me the most general, comprehensive, or popular one. The genus Coriaria, which is a small one, confined, so far as we at present know, to New Zealand, America, (from Mexico to Chili,) Southern Europe, India, (the Himalayas,) and Japan, if not belonging to a subdivision of the Ochnaceæ, represents a separate natural order closely allied thereto, and to the Rutaceæ. But the most distinguished botanists are at issue as to its precise place and alliances in the vegetable system.

In 1862 I examined, with the following results, all the specimens and species of the genus Coriaria, contained in the

1. Hookerian Herbarium, Kew;
2. Benthamian Herbarium, Kew; and
3. Herbarium of the University of Edinburgh.

I. C. ruscifolia, L.—Specimens labelled New Zealand, and collected by Drs Hookers and Sinclair, and Rev. Mr Colenso, are precisely the Otago "toot:" South Chili, Reynolds, and various other Chili specimens from the Paris Herbarium, also resemble the Otago plant; as do generally the South American specimens of this species. Chiloe, Captain King, near rivers in the province of Voldivia. Environs of Concepçion, Chili, 1855: Ph. Germain: leaves more acuminate than in majority of Otago specimens; Concepçion, Cumming. Raoul Island and Kermadec Islands, July 1845; John MacGillivray, "Voyage of H.M.S. *Herald*;" Bot. No. 977. Sub. nom. C. Cunninghamii: Bay of Islands: the larger-leaved form of my Otago plant. (Hookerian Herb.)

New Zealand, Dr Hooker, 1842: includes two specimens—one with a broad ovate leaf, like the majority of the Otago plants; the other, with a greatly smaller leaf, intermediate between the typical size in C. ruscifolia and that in C. thymifolia; the shape, as well as the size of the leaf varying in the same plant, being ovate towards the base of a branchlet, and becoming ellipsoid, and finally lanceolate, as we approach its apex. Sub nom. C. sarmentosa, Forst, New Zealand, Sir W. J. Hooker, 1838, has long acuminate leaves, and long slender racemes like the Himalayan C. Nepalensis. Near Concepçion, Chili, H. Cumming, 1831: Chili, Bridges; quite the Otago plant, though the leaves are somewhat more acuminate.—(Bentham. Herb.)

Concepçion: Leaf like that of the Otago plant; long, elegant, slender racemes. Valdivia: sub nom. C. sarmentosa. North Island, New Zealand, Dr Sinclair: "Tūpakīhi," in the vernacular; exactly the Otago plant; like South American specimens, has long, elegant, slender racemes.—(Edin. Herb.)

(*To be continued.*)

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THE VETERINARY REVIEW

AND

Stockowners' Journal.

ORIGINAL COMMUNICATIONS AND CASES.

Additional Observations on the Component Structures of the Foot of the Horse, and its Economy. By JOSEPH GAMGEE, sen.

THE first part of the following paper is a reprint of a letter which I addressed to the editor of the *Sporting Times*, in explanation, after a notice by the learned editor, of my paper on the component bones of the horse's knee.

In proceeding to enlarge on the subject commenced last month, I have thought well to retain the following, it being not only pertinent to the past and that which is to follow, but is, I think, all the more worthy of preservation, owing to the embodiment of the remarks of the acute critic :—

Sir,—In the critical remarks which you have done me the honour to make in your current issue, on my paper in the *Veterinary Review* for this month, relating to "The Constituent Bones of the Horse's Knee," you have incidentally alluded to questions foreign to the matter before the reader; and, as it appears to me, in a way partial, and not tending to a direct or early solution of any question whatever. You will therefore, I trust, allow me space for another attempt to set the question referred to in a more intelligible aspect, than in my essays and letters hitherto published, I seem to have succeeded in doing.

You say that I have "denied the possibility of roaring existing as an infirmity of racehorses," and "denied the existence of a suspensory ligament in the leg of a horse, and therefore the impossibility of its giving way when a horse 'breaks down.'"

Taking up these questions in their order, I will try to establish an understanding of what I have denied, and hold to be inconsistent with truth, and what I have not only never denied, but expatiated on, as really important phenomena to be studied. I have not said that racehorses are not liable to become roarers; but have said, and again repeat, that roarers can never be racehorses, according to the right sense of that phrase; in other words, I maintain that when a racehorse, in the course of his turf career, becomes afflicted with the confirmed affection of roaring, that he thenceforward ceases to be a racehorse of normal capabilities.

Reference could be made to instances of controversy, in which professional men, and others experienced in horses, have sided, in emitting the declaration that horses, lame of their fore-feet, may still be clever hunters, and even perform successfully on the turf. I hope that there is no need of my reminding yourself and readers, that I dissent from the employment of lame horses for such exceptional performances; and regard the serious discussion of the question, though necessary, as notions prevail, as the reverse of creditable to my country, and inconsistent with horse-loving and humane professions.

Roarers and lame horses may serve gambling ends, but never the true aims of sport.

Either may meet horses similarly or otherwise infirm, horses innately their inferiors, or handicapped to balance chances; and if a race be so won, I am at a loss to see cause for congratulation, while, as a rule, the egg will cost more than it is worth. Roaring, like other infirmities, exists in various degrees; in one the powers of the animal may be but little affected, in another greatly; and he may not be worth the cost of a month's keep. I hardly know that time is sufficiently well spent in dwelling on this subject, since it appears that the turf public has made up its mind not to trust to "roarers." The questions inquired after, generally relate to verifying, intensity, &c. No longer ago than at the beginning of the present year, betting men were startled by weekly fluctuations of the odds against Liddington and Chattanooga; the questions mooted in either case had reference as to their being roarers or not.

On the second proposition which you have introduced—"He has denied the existence of the suspensory ligament,"—let me again say at starting, that instead of denying the existence of the structure which goes by that name, I only deny the attributes which have been, without due investigation or any reason whatever, given to it. I am afraid that I cannot go into the question again here at sufficient length to clear up the matter; the subject is of so purely a technical character, that few of the readers of a sporting paper can discuss it, while for yourself you know where to find my views more extensively set forth. I must, however, acknowledge my appreciation of the influence you may exert on the progress of veterinary science, and in your notice of my last paper, you have, I think, rightly put these matters before the jury—the public—where you say of me, "In this we contend that he must be taken to be in the right until the opposite has been proved; and no one has yet come forward to split a lance with him. This is not creditable to the veterinary profession. Apathy, the sure forerunner and invariable companion of ignorance, is, we fear, the besetting sin of the 'horsey mind.' At present Mr Gamgee is master of the situation." It may be said that a series of most important questions, bearing on the anatomical construction of the horse's limbs, the use of parts, and the action of the whole, which have not received correct solution by men of past times, or, which is equally worthy of note, if the knowledge ever was correctly developed, it has been lost and forgotten before our generation came. Such, I say, being the case, it must not be expected that the proper knowledge can be established and popularised in a mere bluster; the requirement involves labour, step-by-step work, due appreciation of the importance of it, and love for investigation into natural phenomena,—these must all be brought to the field of action before us.

In your criticism you have coupled two distinct questions, "suspensory ligament" and "breaking down." Let me, however inadequately, make the attempt to correct popular notions so far as to set thinking minds in a right direction. The notions I am combating by the force of truth are not old—the phrase "suspensory ligament" is not to be found, so far as I have discovered, in any veterinary work of seventy-five years' standing. The great master, Stubbs, and continental anatomists of the last century, make use of no such words in reference to the structure here referred to. It would avail little to relate the views I entertain on the mechanism of the limb and its functions, unless something was said or already understood of what my predecessors and contemporaries have taught, written, and done on the matter. It is not one or two phenomena only, about which I take exception, but a series; prove one to be wrong, and all will in due course be found wrong. Conversely, when one phenomena is correctly seen, all the rest should be worked out until the harmony of the whole is comprehended. This combination of ligaments arising at the knee, forms essentially the key structure to an insight into a system of functions, the understanding of which makes the mind of the possessor as superior in knowledge of the horse as that of the astronomer over the uninformed sailor or shepherd in physical science. In describing these ligaments, which in their connexions extend from the knee and hock to the last bone in the foot, and attach to every intervening bone in their course, I show that their whole office is of a purely static kind, as much so as is that of the bones these bands accompany in a vertical course, modified to parts in varied degrees of obliquity. These pliable bands, and the rigid bones which support positions, combine to multiply strength, the source of action. The one structure, ligament, is no more capable of being stretched or elongated in the way implied, by the attribute of elasticity, than the other, bone. In the above description all is changed, and with it much more, from the teaching hitherto in vogue.

Though I have quoted authorities—and reference to every modern book which treats on the subject will testify the same—I will adduce a passage from one of the orthodox teachers of the first half of this century:—

"But what becomes of the weight imposed upon the sesamoids [pastern]; they have no bones below to transmit it to? They are in a somewhat similar situation [precisely so] to the splint-bones; they call upon their attaching bands—their *ligaments*—to support them under the load, and their ligaments do so by yielding—they being elastic—so long as force is operating; and the instant it is not, they, through their elasticity, again recover their short lengths, and so raise their sesamoid bones into their places. This descent and ascent of the sesamoids is not to be compared with that imperceptible and disputed motion of the splint-bones; on the contrary, it is a demonstrable and beautiful descending and ascending operation—a playing down and up, after the manner of a spring of most elastic and exquisite workmanship." *

The above is reliable as showing the prevailing notions which veterinary teachers have sent forth, the late writer being, I have no hesitation in stating, the most reliable authority on the actual state of the art in England of our time. It affords me relief however to state, that the narrator was not the author, but the expounder of doctrines as he found them.

I shall not trespass longer now to speak about "breaking down." Readers, seeing the wide difference that subsists between my views and those with whom I differ, on the conformation and functions of the limbs of the horse, will allow that there must be corresponding latitude between us, when we come to regard the way injuries happen, and treat on the means of prevention and cure.—I am, Sir, &c.

[Jack o'Lantern, Hesper, Livingstone, Warrior, Longbow, Devil among the Tailors, and many other horses, have been confirmed roarers, and some of them possessed the infirmity in a very marked degree, and yet have won under heavy weights. Longbow could carry an immense weight, and win in first-class company; and he was perhaps one of the worst roarers ever heard.—Ed. *Sporting Times.*]

The above few instances, to which I allow more might be added, tend to establish the truth of my position, instead of weakening it.

The term roarer is too vague for close reasoning or to sustain an argument on; and any case like that of Longbow would require special investigation, in order that all the phenomena connected with it might be understood.

Though racing affords the most reliable test, not only to prove the powers of sound horses but to measure the influencing effects of some infirmities, it is, notwithstanding, well to enlarge the field of inquiry, and when speaking of any disease, both causes and effects may be best seen by taking a broad survey over subjects. The large sized English coach-horses, as a class, furnish more bad roarers than any other that I know of; and all who deal in them know the fact, and of its importance in estimating their commercial value and usefulness.

In the following *resumé*, after making some brief references to the structure and functions of the knee and hock joints, considered as distinct regions of the fore and hind limbs, and thence pursuing my remarks on the metacarpal and metatarsal regions, I shall devote the time and space at my disposal in attempting to establish some new views on the construction and functions of the digital regions, (the foot proper.) In this I shall blend in my views, as I shall attempt in my description, an aspect of formation and functions—the only way by which I believe interest can be excited or sustained on such a subject.

Next to the solid structures—viz., the bones, their individual, relative, and combined action—and those ligamentous bands which act with them; with the nail, or hoof, and the yielding, though none the

* "Perceival on the Form and Action of the Horse." London, 1850.

less powerful structures; the cartilages, planta bands, and frog, will all be taken under our cognisance.

After devoting more time and labour than probably contemporaries and readers will give me credit for, in my researches on animal locomotion, and finding that the only way by which I could bring my mind to a comprehensive view of the subject was, after mastering many important details, in which process exclusion of attributes, and inclusion of functions seen, was carried on; I learnt that the only ultimate complete view could be comprehended by taking in a rapid glance, every action over the latitude of structures, from the termination of the shaft bones at the knee and hock, to the part which forms the point of resistance on the ground.

The carpal bones, as we saw by the description given in my last paper, being divided, as is well known, into two rows, or orders, are endowed with very distinct functions. The three upper bones support the radius, and act with it; the fourth bone, the piseform, acts partly with these, and partly under the direct influence of muscles whose tendons are inserted into it. The radius, acting with these four bones at its termination, is the most considerable shaft of the limb. The other four bones of the knee belong, in their offices, to the metacarpal region, and these are essentially in their office static, in contradistinction to the carpal bones of the upper order just noticed, which are dynamic or movers in their functions. The lower order of carpal bones are closely adapted to the heads of the metacarpal, with irregularly flattened undulating surfaces between them; their edges in that aspect appear sharp, showing that adaptation, strength, and limited motion, is the attribute of the lower one of the three joints of the carpus; but looking at the upper surface of the three bones in the lower range, which articulate with the three above, we find the upper surface irregularly rounded, adapted to socket concavities in the order above, by which extensive motion and great strength in combination is provided. The whole power of the fore limb is represented by the force exerted through the great shaft, the radius, and its range of carpal annexations on to the lower carpal, metacarpal, and digital bones.

The hock—the parallel joint of the hind limb to the knee, in the fore—requires to be also carefully dissected and studied, on account of its wonderful mechanism and functions.

This joint, like every part of the hind limbs of the horse, is more correctly understood than the corresponding parts of the fore limbs; and the fact—for as such I regard it—may be accounted for in two ways. Firstly, the hock bears so close analogy to the human ankle that comparative anatomists, who understand the latter, could not fail to see correctly into the formation and functions of the former. Then the similarity of conformation and functions of the lower or posterior extremities of all the Mammalian tribes bears so much resemblance, that not only does extended study and exact knowledge confirm these statements, but it is also true that popular notions are established *accordingly*.

Very different is the case respecting the fore limbs. Not only does there seem to be great difference between the hand of man and the foot of a horse, but few see much resemblance between that region in the latter, and the corresponding one in other quadrupeds.

These great apparent differences may be reduced to their littleness, and shown to be mere atoms in the scale, by extension of labour and study on the whole subject.

With regard to the limbs of the horse, relative to their assigned functions, the adage that "the strength of a chain is in proportion to its weakest link," applies.

Looking at the fore and hind limbs, as anatomists, we perceive that at and about the knee and hock regions, some great and powerful structures terminate. The tendinous end of great muscles are inserted into the projecting piseform bone at the back of the knee; and in the hind, equally powerful muscles act on the point of the hock; the os calcis—where again these structures terminate by insertion—other tendons, appendages to the muscles concerned in locomotion, terminate over the upper heads of carpal and tarsal bones, until we trace down to the last phalange, where we find only one flexor and one extensor muscle represented by their respective tendons inserted into the pedal bone.

I submitted this suggestive question, in a paper which I published in the *Veterinary Review*, three years ago; but evidently did not set the phenomena in a proper light, from the fact of no notice of so important a subject being elicited. I will, therefore, try again.

I have over and over again shown that the splint bones, by their inverted tapering shape, giving advantageous hold for ligamentary structures, are all powerful in conjunction with the carpal, tarsal, and shank bones. That between these inverted pyramidal bones, and arising from the bones composing the respective joints, and the heads of the shank bones, is a system of ligaments which in both limbs arise as a double structure. One of those branches has received the funny, if not absurd name, of the elastic suspensory ligament; the other, the uppermost branch which arises from behind the knee and hock bones, by which it is acted on in their motion, has been almost ignored, so much so that neither name nor use has been assigned it, rational or erroneous.

This upper branch of the common ligament, which divides from the lower, soon after their origin, blends with the two flexor tendons of the foot, and for all intents and purposes these three structures are one, bearing the force of muscular action which the wonderfully constructed shafts impose on them. These two tendons, and the ligament of similar substance, form one powerful *rope*, not inaptly called the back sinew; it passes over the projecting pair of sessamoids, which are furnished with a groove, where a smooth synovial capsule lubricates the passage, and one of the two tendons, receiving the other within its expansion, becomes inserted into the coronary

bone; while the long perforous tendon goes down the bottom of the last, the pedal bone. Meanwhile, the upper branch of the great ligament we started with, has become so blended with the fibrous of the two tendons, as not to be distinguishable where they become condensed in texture at the pastern joint.

The under and greater branch, from the knee, passes down, closely connected with the shank bone, between which there is a bed or padding of areolar and adipose tissure, to prevent any asperities of the bone affecting the ligament under exertion.

I shall not now dwell on many morbid phenomena which I find frequently present, and which, in some cases, help greatly to elucidate normal functions.

The pair of sessamoid bones are connected in their central line vertically by fibrous tissue, which, by its pliability, allows a slight degree of adapting lateral motion; while by their strong connecting ligaments attaching to the lower extremities of the cannon and head of the pastern bones, effectually complete the closing up of that joint, and extend the range of surface for the cannon bone to revolve on.

The great carpal ligament, or tarsal ligament, as we may call it, in the hind limb, divides again into two equal branches, about two-thirds of the distance from the knee to the pastern joint, which branches are strongly inserted into the upper and lateral aspects of each sessamoid bone, where a portion of the substance being expended, the remainder passes obliquely downwards over the pastern bone, where it blends with the lower extremity of the extensor pedis, tendon, the whole constituting a broad ligamentous stay, which is inserted into the anterior elevation of the pedal bone, and where, obviously, the whole forms the main stay in arresting the anterior part of the foot, in action. This, the undermost branch of the great ligament, obtains four distinct advantageous holds on the bones below. One in each sessamoid, and two laterally and anteriorly into the pedal bone; while those of the upper branch, whose fibres we have seen merged with those of the two tendons, have descended with them behind the pastern, to be inserted one into the coronary bone, and the other into the strong arch of the pedal bone.

Now, about the sessamoids, which are said "to play down and up." Those we find are strongly fastened down to the pastern bone by means of two broad ligaments, which occupy the whole of the posterior surface of that strong bone, capacious for attachments externally, and for articulating purposes at both extremities. The strength of the attachment afforded to the sessamoid on to the pastern bones, inferiorly, is demonstratedly equal to any power acting on them which can be traced from above.

I thus see how to account for every atom of texture and strength, representing all the force that the animal machinery above can generate and multiply. But as yet I have only half done my task, and if I were to stop here I should have proved nothing at all.

I have shown that one of the two great tendons, passing down *behind the* shank-bone in the fore and hind limbs, the perforatus, has

been inserted into the upper head of the small pastern bone. And what of that? Surely, says the old school, when so much power has been traced to within an inch or two of the bottom of the foot, and only two bones exist beneath the interruption, enough has been exhibited to account for all the power and action displayed. Not so, however; we might as well have had the connexion cut off at the knee and hock, as for it to stop short two inches from the bases of support. I accordingly find a new system of structures representing, if not multiplied power, at least an equivalent for the change now discovered.

I begin now to investigate from below, where I find a coalescence of beautiful construction, not to be exceeded, as far as the human mind can estimate, by any of Nature's works in animal mechanism. As the engineer shifts his wheels and axles, thereby gaining force specially directed—he following nature—so we see how in this terminal region of the horse's limb a change of mechanism is given. And with what effect? In our new aspect the pastern bone has become the lever power in the region to which our attention is now directed, and the first pair of ligaments, which I shall again notice, have several times already been described by me, and illustrated by a drawing, which was reproduced in this *Review* in May last. From each extremity of the navicular bone runs obliquely forward over the coronary bone a strong ligament, which attaches to roughened surfaces over either lower condyle of the pastern bone. Further, a broad expanse of ligament occupies the space between the two posterior extremities of the pedal bone, which has its strongest attaching points inserted into the inner aspect of both extremities of that bone, contiguous to the basilar processes, and passing upwards gives off bands, which become the connecting ligaments between the pedal and pastern bones; having their attachment on the posterior outer surface of the pastern bone, from a little below its head down one-third of its length. These structures and their connexions, which diligent dissection and individual research alone can realise into an acquaintance of, make up the more essential parts of the resisting lever power of both fore and hind limbs.

I have not yet done with the question, nor indeed have I much more than touched on the most characteristic phenomena to which all the rest are subordinate. The frog, regarded as a tendon, or, if that term be inadmissible, as a ligament, is a structure about which much has been written, and controversies have been kept up, without anything being elicited to show its true character, either anatomically or physiologically; occupies, as is known, the chief space posteriorly at the bottom of the foot. The frog, instead of being, as it has been called, "the fatty frog," is a strong band of inextensible ligamentous fibres; accumulated into an oblong ridge, which is strongly inserted into the centre, taking a transverse line, of the coffin-bone in its planta arch. A strong lateral ligament, on either side, is given off from the frog, which blends with the most considerable attaching points of the perforans tendon; these united are inserted on the

inner aspects of the extremities of the pedal bone and the cartilages. The perforans tendon then, expanded out anteriorly, forms the joint capsule, where, spread like a fan, it is inserted into the margin of a concavity of the pedal bone. Between the perforans tendon and the frog is stretched across, from one lateral wing of the pedal bone to the other, the ligamentous web already referred to, so that, although the frog passes over the expanse of the perforans tendon, it does not press on it; each is distinct and free in its action, there being an interposition of loose fibrous tissue.

The frog is divided posteriorly, having a concavity, or "the cleft," in the middle line. The lateral ridges are made up of ligamentous bands which blend posteriorly with the lateral cartilages. This description, however, is more correct when the order of narration and investigation is reversed. Thus the frog should be viewed as a tendon or non-extensible, but very pliable structure, appended to the cartilages which, turning round, merge into a more adapting structure, has its point of fixity in the concave centre at the bottom of the pedal bone. Bounded by the cartilages laterally, with which there is a systematic and strongly interwoven connexion, consists a double cushion, made up of ligament, yellow elastic tissue, interspersed with adipose membrane. These various parts are intimately blended in their substance, and equally so will the functions of the whole be found to harmonise.

As has been observed, the strong ligaments taking hold on the whole lower aspect of the bony and cartilaginous structures, are connected to the pastern bone as their shaft; as is also the frog with the lateral cartilaginous, connected by ligaments which are attached to the pastern bone, contiguous to the line of insertion of those described. I have never before written on these wonderful phenomena, nor had I sufficiently elaborated the scheme before an advanced period of last session, and I am in the midst of questions, too great in their importance to be treated incidentally at the end of a monthly contribution; yet they were too important to be left longer without giving others the benefit of the views, so that an increased number of observers may be put on the scent.

Before I speak, in conclusion, on the action of the horse, to describe how the various structures noticed obey, I will, in a cursory way, throw out a few further remarks.

The structures on which I have imperfectly touched, are those more powerful, and without which no action could take place; yet there lies another system of important structures, whose functions, individually, are less obvious, and yet in the aggregate make up in an equally essential way the whole effective limb of the horse.

The fetlock—or I would say the footlock pad—is a centre in the limb of the horse regretably neglected by anatomists. Through strong fascia there is exactly sustained connexion between the knee and this said pad, which pad is made up of very similar structures to the frog,—*ligaments*, elastic and fatty tissue, with an accumulation of cuticle, or

a mass of horn, covering the true skin, around which is given a tuft of hair, more or less abundant, according to climate and breed of horses. I shall say nothing now about the barbarous custom of cutting off alike the hair and horn, both most essentially necessary to be left.

The position and action of the pastern pad is regulated by ligamentary bands, of which it is to a great extent made up, interwoven as they are with the true skin. Posteriorly, in a median line with the joint, is the ergot, the horny substance, of the shape of an acorn, which is surrounded by a tuft of long hair. The ergot is a superficial structure, and like the coronary band and horny frog, is a production from, or rather an amplification of, the common cuticle. The pastern pad, with the ergot and tuft, are designed for important functions; altogether, they serve the same ends as the two small claws do in cloven-footed animals. The hair, when left in its natural state, as it always should be, is the best defence against commonly occurring skin affections of the legs.

Of the important part the skin plays in the functions of the pedal extremity of the horse, I have not time to dwell; suffice it here to say, that these are considerable, and insufficiently appreciated.

The hoof, a most important constituent part of the foot, must be passed over now with mere reference, as it has been several times described in the *Review*, and its economy fully discussed at page 193, vol. for 1863.

The action of the horse. Though I have, in several papers, treated on this subject, it is so important that I have kept constantly working at it, and find it necessary to return to the discussion. Indeed, until the details on the locomotive functions are intelligibly set forth and generally known, there will be continual controversy on these questions which should be plain to all.

If we turn attention to the fleetest of animals, taking two of different species, we may see how leverage construction economises muscular exertion, and with what obvious effect.

The apparently slender shanked deer; and the perfectly formed blood-foal, of about six weeks old—are worthy of contemplation. They exhibit respectively a development of parts, and an arrangement of leverage power, by their lengthened carpal and digital regions. The great speed, with relative little muscular force exerted, which these animals can display, is marvellous. With small short feet, their long and advantageously-placed pastern and shank-bones, afford the most perfect system of leverage anywhere to be witnessed in the range of animal mechanics. The foal, at that tender age, will display a degree of velocity nearly approaching that of the full-grown horse of its breed. Such economy is due to length of leverage, relative to the weight of the body to be moved.

Though those slender animals astonish us for effect, locomotion may be best studied in heavy horses. Few people can be induced to see and learn from objects which are daily before their eyes. Men

walking, horses and dogs moving constantly before us, excite no inquiry; but a horse-gallop on a racecourse may elicit some attention; and so may horses drawing steadily up an incline, with a load behind them that requires all their force in action to keep it moving.

In both cases the action going on is essentially alike; only one horse is extending his limbs to the fullest allowable range, while the other takes necessarily short steps. Looking at the horses drawing slowly these heavy loads, we begin at length to analyse their movements; and the mind, assuming that the mechanism of the parts is known, and that those phenomena are being reflected on, can follow from the slow to faster paces, and from one degree of velocity to another, with a perfect understanding. Let us try and follow the example of advertising teachers, who pretend to make musicians and teach a language, or the art of writing in six lessons—assuming the plan to be good—we take no responsibility for the result, as to how long each separate lesson may require to be worked at—but merely adopt the plan.

As the horse drawing a load makes his first effort to move it, he raises one fore foot, the knee of which is bent, and the arm extended forward. The other fore foot is planted before the body, and is, as well as both hind feet, acted on by the shafts with the design of drawing and propelling the body forward, and the load behind it as well. The first fore foot lifted is held up until the body moves, and if no movement be accomplished, the foot is reimplanted in its former place; taking the normal case when power overcomes the resistance, the body moves, and the foot is implanted, the instant before which occurrence the opposite or diagonal hind is lifted, and is moving under the body past the centre of gravity, when the other fore is lifted, and the hind alights contiguous to the place from which the fore has moved; next the other hind foot is raised and carried forward in like manner, when its parallel fore moves, as the hind passes the centre of gravity, to give place for its alightment.

This completes the movement in the walk. One fore foot at a time is extended before the body, and its diagonal hind immediately succeeds and is carried under the body, and in every move there are three feet resting on the ground, with one extended and being carried forward with the moving body; further, the phenomenon of there being three feet on the ground and one relaxed and elevated, is subject to the exception that in each movement of the fore feet there is an instant when neither parallel fore and hind foot bear on the ground, viz., each fore foot is lifted just as its parallel hind is coming to take its place; and in all cases of free-moving-horses the hind foot falls several inches before the place whence the fore moved. This balance is disturbed by heavy weight being attached to the horse, when, as shown, the body moves slowly, and each step is accordingly *short*, and the hind foot stops relatively short of reaching the *imprint left* by its parallel fore.

Passing over the trot for the present, I will, secondly, consider the gallop, and take a racehorse, and an open training-ground, for my sphere of observation. Cantering and galloping as they are spoken of in the technical phraseology of the turf, mean the same thing. The only difference consists in the degrees of energy called forth, and the speed that is carried on. The canter of the riding school is a distinct and artificial pace. Without taking account of degrees of velocity, I treat the gallop of the blood-horse in training and in the race as one and the same, in order of position of the limbs and sequence of movement. In the gallop, the horse lifting his near hind foot exerts his powers on the other three, the body moves, and the near fore foot is raised as its parallel hind passes the centre of gravity; when in turn the off hind is moved, the near fore having in the instant alighted, and while it is passing the line of gravity its parallel fore likewise obeys the law and moves. These actions are made intelligible, only as they are seen under actual occurrence. Unless the constant and rapid movement of the body is taken into account, the distance between the different steps, and that between where each foot moves from and where it alights, must remain a puzzle, to solve which, inextricable difficulties have been hitherto encountered.

As I showed by a drawing in my prize essay, published in the Royal Agricultural Society's Transactions; in good and well-trained gallopers, there is about an equal distance between the imprint of their feet from the beginning to the end of the gallop, while the same degree of speed is kept up. Principle and not details is what I am contemplating now. The locomotive powers—viz., the limbs—act in diagonal lines, the action of the fore limbs always preceding in the movement.

Each fore foot is moved at the instant when its parallel hind has passed the line of gravity, to be implanted anterior to the place where the fore moved from, to an extent governed by the energy employed, and the velocity the body has acquired.

The limbs of the horse, placed by wonderful physical contrivance between the body of the animal and the ground, act on both. I will try to describe one of these phenomona, and defer, or pass with brief reference over the other.

The fore foot, we say, is extended before the body, and the hind carried under it, (no matter what the pace, the faster it is, the greater the degree.) When the fore foot is planted on the ground, it constitutes a fixed lever, from the knee joint inclusive, to its bearing, or the point of resistance. No muscle, flexor, or extensor, is directly acting on the foot until its position becomes changed, and the burden which presses has passed over it. When that foot was implanted, the lever was in an oblique direction, with the foot forward; but through the action of the radius on the lever extremity, it is raised and passes the vertical line, when it is set free, and its small but adequate muscles flex, and then extend it again, while the body is moving through space, by virtue of the force exertedby the other limbs.

While the fore foot is perfoming the functions described, the hind limb is acting as a lever of another kind. Placed in an oblique line, from the point of the hock to that of the foot, and passed far beyond the centre of gravity, the limb forms a lever in the position, with the properties of the crow-bar, and following the action in each instance of its diagonal fore, raises and propels the body.

I regret the necessity, and feel almost ashamed to dismiss, for the present, so momentous a subject with such inadequate treatment of it.

HEALTH OF STOCK RETURNS FOR 1864.

SCOTLAND.

ABERDEENSHIRE.—*W. Adam, Banchory-Ternan.*—Pleuro-pneumonia in cattle has almost disappeared in this district. Several years ago it was very prevalent, and in badly ventilated byres proved very fatal. This disease can in most cases be traced to contagion, and generally appears on farms soon after fresh stock have been bought, but at times it seems to originate spontaneously on farms where no cattle have been bought in for months previous to its outbreak.

Foot-and-mouth disease has prevailed to a very great extent during the past year, but when the animals were properly attended to none of the cases proved fatal. Black quarter is very common in this district among young cattle, and invariably proves fatal. Animals in low condition removed from poor pastures to a more generous diet are most liable to this disease.

Parturient fever seldom seen; but red water common, and very often fatal, more especially when cows are ill kept, and fed on turnips and straw; but I have never seen a case when animals were supplied with oil-cake as well as turnips. Diarrhœa in calves very prevalent, often fatal, and seems almost of a contagious nature. Diseases of the digestive organs in horses very common in autumn, when the animals are fed with new grain and damp straw. Bronchitis rather common among horses during the winter and spring months. Animals suffering from contagious diseases are seldom, if ever, exposed for sale in our markets, and farmers are very careful in buying in fresh stock.

George Robertson, Ellon.—There have been no cases of contagious pleuro-pneumonia in cattle in this part of the county for several years; but during the past year foot-and-mouth disease has been very prevalent among cattle. Black quarter was more prevalent among young stock during the spring and summer of 1864 than it has been for several years. Splenic apoplexy unknown in this locality. Several cases of parturient apoplexy occurred in the months of June and July; but in such cases the veterinary surgeon is seldom called in. The animals are often killed, and sent to the London market. Parturient red water in cows prevailed to a much greater extent than

usual, owing to the great abundance of turnips. Diarrhœa in calves was very common in spring, but when properly treated this disease seldom proves fatal. Among horses the principal diseases I have met with have been catarrh, colic, and indigestion. The diseases of sheep and pigs seldom come under the veterinarian's notice, the former being attended to by shepherds; and when anything is seen amiss with the latter, they are generally killed, and sent to the London market. During the spring months rheumatism was very prevalent among young stock; and in one case I saw, the tendons of the gastrocnemii muscles gave way, and the point of the os calcis protruded through the skin. Cases of abortion in cows were very common in autumn. In some of our local markets English cattle, suffering from foot-and-mouth disease, have been exposed for sale, and have communicated the disease to healthy stock coming in contact with them. I have heard of two cases where people attending to cattle affected with epizootic aphtha have suffered from the disease.

W. Ironside, Clofrickford, Ellon.—Foot-and-mouth disease very prevalent, brought into the district by English or Irish cattle exposed for sale in our markets. Black quarter very common among young stock, and in most cases fatal. Setons in the dewlap seem to have a very beneficial effect in preventing this disease. A few cases of parturient fever have been seen during the past year. Red water has been rather prevalent, but in most cases the animals recovered. Diarrhœa in calves very prevalent during the spring, and terminated fatally in a large proportion of cases. Horses have, as a rule, been pretty healthy. The principal diseases I saw during the winter were colic and indigestion.

W. Burton, Harthill, Keig.—Foot-and-mouth disease very prevalent, owing to English cattle suffering from it being exposed for sale in our public markets. Black quarter among young stock rather common, and invariably fatal. There have been rather fewer cases of parturient fever than usual; but rather more than the average number of cases of red water in cows after calving. Diarrhœa in calves prevailed to a great extent, and proved fatal in a good few cases. Horses have suffered chiefly from diseases of the digestive organs.

W. M. Reid, Leochel-Cushnie.—Glanders and farcy in horses a few cases, not very common. Pleuro-peumonia in cattle has not been seen in this district during the year 1864, and I have only met with a few cases of foot-and-mouth disease in cattle. Black quarter rather more prevalent than in former years. Cases of splenic apoplexy often occur when the thermometer is very low, but with a change of temperature many of the affected animals recover. Red water in cows was very prevalent, and in a great many cases great prostration and debility were marked symptoms of the disease. Diarrhœa in calves often proves very troublesome in this district, and a large proportion of the cases terminate fatally. Among horses diseases of the respiratory organs have been less prevalent than usual; diseases of the digestive organs, such as colic, &c., more common. The most common

disease among sheep in this district is braxy or black quarter. Scab is seldom seen, being to a large extent prevented by repeated washing.

A. Keith, Strichen.—Outbreaks of pleuro-pneumonia in cattle I have in all cases readily traced to contagion, and treated the disease as such with great success in some instances. As many as 90 per cent. of the cases recovered. I find that isolation of the affected animals, with rational treatment and good nursing, often puts a stop to the disease, or modifies it, so that the fresh cases are of a less virulent form. Foot-and-mouth disease not so prevalent as in 1863, owing, no doubt, to the care taken in buying animals from the south markets. This disease is very troublesome to the farmer, but seldom proves fatal. The number of cases of quarter-ill are decreasing yearly, care being taken of young stock, so as not to let them down in condition. I believe the best method of prevention for this disease is to keep the animals well, and have them steadily progressing towards fattening, or to take their place in the herd. Parturient fever is usually most common, and proves most fatal soon after cows go to grass. Cases occurring before this season seldom prove fatal. Red water has been more prevalent among cows than for the last ten years. If occurring within ten or twelve days after calving, the disease is often very severe, and in many such cases terminates fatally. Cases that have been neglected for a day or two, and the bowels constipated, seldom recover, but otherwise it is rather a mild disease. The cases of diarrhœa in calves are yearly on the increase, and during last year I am sure as many as 95 per cent. of the young calves in this district suffered from the disease. I treat all such cases with the common Gregory's powder, reduce the quality, but not the quantity, of their food; that is, give half milk, half water, until I see evidence of the stomach recovering. Among horses I met with many cases of catarrh and sore throat in the end of the year, and a few cases of typhoid pneumonia and influenza. The end of the season was remarkable for the number of cases of diseases of the digestive organs in horses, attendant on teething. An epidemic diarrhœa prevailed for eight or ten days in the month of August. Cases of colic and indigestion less prevalent than formerly, owing to horses being more carefully fed. The principal diseases sheep have suffered from in this locality during the past year have been mammitis in ewes and scab. Farmers bringing stock home affected with the foot-and-mouth disease are perfectly aware of its contagious nature, and have never to my knowledge offered such for sale in any of our public markets.

AYRSHIRE.—*R. Mackie, Loudon Cottage, Galston.*—Pleuro-pneumonia in cattle has twice made its appearance in this district, and on both occasions raged for nearly two years. It seems very doubtful at times how the disease originates; in some cases it can be readily traced to contagion, breaking out after fresh importations of stock; *in other* cases, parties have no idea how the disease originated among

their stock. I believe that this disease may lie lurking in the system for months before it shows itself, and I have often observed that neighbouring farmers suffer from it the following year. When pleuro-pneumonia breaks out among dairy cows, they generally abort if they have reached the fifth month of pregnancy. On an average one-third of the cases prove fatal, and with the exception of careful nursing and isolation of the affected animals, all treatment has proved useless. Inoculation has not been tried in this district to my knowledge. Foot-and-mouth disease often spreads all over the district, and often proves very troublesome, more especially among milch cows, the teats and udder being affected, and the secretion of milk almost entirely suspended. During the months of March and April, black quarter was rather prevalent among young stock, and about five per cent. died. A small quantity of oil-cake given to each animal daily during the winter, acts very beneficially as a preventative for this disease. The loss of cows from parturient fever is often considerable; the animals generally affected are cows that have been well fed, and in high condition. Most of the cases recover in the months of March, April, and May; but in June and July, when cows are at grass, this disease almost invariably proves fatal. Milking before calving, blood-letting, &c., have been tried as preventatives; in some cases the former proves beneficial, but in all cases the latter is dangerous, and reduces the strength of the animal at a time when the chief object is to keep it up if possible. Every year a few cases of diarrhœa in calves are seen. The popular cures for this disease are tea, rennet, or laudanum. A good few cases die from being neglected and not properly treated in time. Red-water is unknown in this part of the country, and we do not see one case of ophthalmia in a hundred animals. The animals exposed for sale in our public markets are generally healthy; exceptional cases of animals suffering from contagious diseases may be seen, but such are very rare.

W. Irvine, Girvan.—Pleuro-pneumonia has only been seen on one farm in this neighbourhood during the past year. The cause of the disease was not very satisfactorily made out. The owner had a grass park, rented some twenty miles from home, in which a number of young cattle were grazed. These first showed symptoms of the disease, and from them the contagion spread among the dairy cows, a good number of which died. Foot-and-mouth disease has been very prevalent, due in all cases to contagion from animals being exposed in markets, or travelled in railway trucks. Cattle, sheep, and pigs have all suffered from the disease. The most prevalent diseases of the respiratory organs in horses were influenza and pleurisy. Diseases of the digestive organs in horses less prevalent than usual, owing to a better system of feeding. During the year I have seen one case of purpura hemorrhagica, and two of periodic ophthalmia in horses. I have only seen one case of black quarter, and two of splenic apoplexy during the past year. Parturient fever has prevailed to a limited extent among well kept cows. Red-water is often

very prevalent after calving, and on some pastures a few cases were seen last summer. Ophthalmia was very prevalent among sheep in the autumn, and cases of sturdy and braxy were rather common. Pigs suffered chiefly from affections of the respiratory organs. Last season a large proportion of the calves suffered from diarrhœa, which proved fatal in many instances. In our local markets we have only home-bred stock exposed for sale, and therefore cases of contagious diseases are seldom if ever seen. Any outbreak of such diseases can be readily traced to animals purchased in large markets, such as Falkirk Tryst.

BERWICK.—*J. H. Calder, Swinton Hall, Coldstream.*—I have heard of no cases of pleuro-pneumonia or foot-and-mouth disease in this neighbourhood during 1864. Sickness in hoggs was very prevalent when they were first put on turnips, from 7th October until 17th December, and a good many of the cases terminated fatally. I lost 19 out of a flock of 300. In the spring and early part of the summer of 1864, I saw many lots of cattle suffering from foot-and-mouth disease exposed for sale in public markets, but heard of no serious or fatal results.

R. Watson, Coldstream.—Pleuro-pneumonia in cattle prevailed to a considerable extent, traceable in the majority of cases to direct contagion. It principally originated among foreign or Dutch cattle brought into the district. Foot-and-mouth disease has not prevailed to any great extent. Among horses, diseases of the respiratory organs rather above the average; many of the cases severe, but the mortality very trifling. Affections of the digestive organs in horses numerous. I have seen very little of quarter-ill, and only a few cases of splenic apoplexy in situations where it prevailed previously. Parturient fever, a few cases, and several cases of red-water in milch cows during the months of March and April. Cases of diarrhœa in calves very common. There was a considerable mortality amongst pigs from enteric fever and pneumonia. Cattle were shown in our autumn markets in rather poor condition. Several—more especially among the foreign cattle labouring under the incubative stage of pleuro-pneumonia—lots have been bought by farmers, and when pleuro-pneumonia broke out, they at once sent them into the market and re-sold them; and thus our markets are a fertile source for the propagation of contagious diseases.

CAITHNESS.—*George Brown, Wick.*—There have been no cases of pleuro-pneumonia in this county for a number of years, and I have heard of no cases of foot-and-mouth disease during the past year. Colds and influenza rather prevalent among horses, but none of the cases have proved fatal so far as I know. There have been about the average number of cases of diarrhœa in calves, and cases of quarter-ill among young stock rather below the average. During the *year 1864,* the losses among sheep have been very small compared

with former years. A few cases of inflammation of the stomach and bowels among hoggs on turnips, but not much over one-half of what we usually see. Scab is not at all prevalent among the sheep here; there may be a few cases occasionally in badly managed flocks. Throughout the year stock have been very healthy, and I have seen no animals labouring under contagious diseases exposed for sale in our public markets.

DUMFRIES.—*Robert Borland, Closeburn.*—Pleuro-pneumonia has only appeared to my knowledge in one instance, among a lot of fat cattle, where nothing of its origin was positively known. Foot-and-mouth disease prevailed to a considerable extent last autumn among cattle; and on my own farm, the disease appeared among a lot of cattle I bought at Newcastle fair. A good many deaths occurred among hill sheep last spring, from scouring, brought on by the severe weather. Pigs died in large numbers, from a kind of convulsive fits, accompanied with loss of power in the limbs.

Charles Craike, Lochmaben.—During the year 1864, stock have been remarkably healthy in this district. I have not heard of a single case of pleuro-pneumonia in cattle, and foot-and-mouth disease has not prevailed to any great extent. Among horses there has been about the average number of cases of colds and coughs, &c.; affections of the digestive organs trifling. About the latter end of 1863, and beginning of 1864, quarter-ill appeared among my young stock to an alarming extent. I lost three two-year-old Ayrshire queys, and had other ten or twelve affected, all of which recovered. Among sheep the most prevalent diseases were foot-and-mouth disease, foot rot, and scab, and on several farms considerable loss was sustained in the autumn from inflammation both in hoggs and ewes when put on turnips. There has been a great mortality among pigs in the winter from inflammation of the lungs and cramp in the legs. Our markets have been pretty free of contagious diseases, with the exception of an occasional case of foot-and-mouth disease, and scab in sheep. Epizootic aphtha is chiefly brought into our district from the Lothian markets and English fairs, in October and the latter end of the year.

W. A. Jeffrey, Braehead.—Contagious diseases prevailed to a very limited extent in this district during the year 1864. I only heard of one outbreak of pleuro-pneumonia, of a mild form, among a lot of cattle brought into the district from a distance. Foot-and-mouth disease has been solely confined to cattle and sheep, which were brought from distant markets, such as Falkirk. A considerable number of horses were affected with diseases of the respiratory organs during the autumn, when the weather was changeable. Sheep have been remarkably healthy, except a few lots bought in distant fairs affected with foot-and-mouth disease, and scab, in a few cases, where sheep were brought from the north.

EDINBURGH.—*J. H. Coates, Penicuik.*—Foot-and-mouth disease

LETTER TO THE EDITOR.

To the Editor of the "Veterinary Review."

ALDERSHOTT, 15*th August* 1865.

SIR,—Agreeing with Professor Joseph Gamgee as to the necessity of guarding against being misunderstood, and feeling that his remarks in consequence of my two last letters, only tend to mystify what is very plain, viz., that which I *have* written, and am prepared to abide by, although I object to be held responsible for the inferences the Professor chooses to deduce from them; therefore I must again claim the right of reply to his remarks, in your journal of the present month, to set forth what I have written. The Professor says he does not know what I require of him. I will therefore repeat the questions I put in my letter of April 7th, as I am still waiting for his answers to them. 1st, "Did he ever find true ulceration internally with a *sound* articular surface?" 2d, "If it commences internally, how is it that the ulceration does not show itself on the *anterior* articular surface of the navicular bone?" And, "Why does not the wasting of the coffin-bone lead also to ulceration externally?" Again, Professor Gamgee says that the history given by me does not accord with the first account of the case, where I said, "the horse was sound one day and lame the next, never again to be sound;" and in the history (which was given in reply to stated questions from him), I wrote, "He had never been lame previous to the foot lameness which commenced in June 1862, and was sudden." This statement I repeated in the letter of the 5th May. I ask the Professor these, to show in *what* the discrepancy consists, as I have constantly and on every occasion repeated my first statement, viz., that the lameness was sudden and permanent. Professor Gamgee asks, "Why permanent?" I need not answer that question, I merely related the *fact*. Further, he says, "the account given of the case by me ill accorded with the parts sent." The whole of the account that I gave of these parts is contained in the following words: "The specimen illustrates the disease as I believe it really exists in the majority of cases, viz., *primarily* in the flexor tendon as it passes the navicular bone." And further on I said, "The tendon at the surface next the bone presents the appearance of having been gnawed by mice, and was, I doubt not, the part first affected." This rough appearance I attributed to "ruptured fibres from a sprain." I now ask, Did the tendon present this rough appearance?—several saw it who thought it did, and people will believe what they see. Were any of the fibres ruptured? if so, the parts accorded fully with my account of them; and as the Professor has the piece of tendon, he can examine it; hitherto he has not described its state. I am quite aware that the state of the synovial membrane lining the tendon can give no information, and would be affected as a consequence, whether the disease commenced in the bone or in the tendon. I have from the first endeavoured to obtain information on the *first* stage of the disease—its nature and seat. Professor Gamgee has been writing of the subsequent changes in the parts, and assumes, because I ignore all effects in the discussion till I have first considered the cause, *i.e.*, the first stage of the disease, that I must consequently be ignorant of them. Upon the same principle, I might conclude that he is ignorant of the first stage, as hitherto he has written of effects only. The Professor thinks a sound navicular bone could not be fractured from a sprain. I quite agree with him; hence I wrote on 5th May, "Fractures at the seat of attachment of ligaments are unusual in bones previously free from change of structure." The Professor agrees with Mr Dyer, who has always thought the term rheumatism a most convenient one. I also agree with these gentlemen when the term is applied to such cases as that in a black gelding, which Mr Dyer records in your journal under that head.—I am, &c.,

ALFRED J. OWLES,
Veterinary Surgeon, General Staff.

After careful perusal of Staff Veterinary Surgeon Owles' note of the 15th inst., Professor Gamgee, sen., sees no reason for modifying, in any way, his former statements.

NEW VETERINARY COLLEGE,
August 25, 1865.

The Veterinary Review and Stockowners' Journal.

THE FRENCH HORSES.

In another place we give a letter, headed as above, addressed to "the editor of the *Sportsman*," from which journal it is taken; and while we endorse every sentence the writer says, the fact may be referred to without detracting from our cordial welcome of this additional—of our having, for several years past, tried to draw attention to the same subject. That there has been need of reform in stud management, and indeed in horse management in general, has not only been known to us, but has been expatiated on and published; and that much of what was defective in England has been shown to have been "better managed in France." In the number of this new *Review* for the past July, in an article headed "The Relative Capabilities of England and France for Producing Horses of High Merit," much of the same course of argument was used as is embodied with statement in the letter before us.

"An Englishman in Paris" shows himself to be master of his subject. His statements, dated as they are from the scene of his observations, are valuable just now to his countrymen at home.

It was reported that the Emperor of the French, in congratulating Count de Lagrange, the other day said, "You have done immense service for the turf in France." Not doubting the accuracy of the opinion expressed by the great ruler, we are inclined to believe that—if the true state of the matter could be dispassionately gone into, with a view to ascertain how little faults had crept into English practice, until they have become great errors, and we could condescend to learn something from the French in such cases — the crisis at which matters have arrived may prove of mutual benefit to English and French turf men, and to horse owners in general.

No less a preponderance of evidence, than has been furnished in Gladiateur's case, could have turned the scale of opinion, or even

arrested the thoughts of the horse-loving public of England, to contemplate the fact of the superiority of our neighbours' race-horses. Other horses, which had shown their superiority to any of their age which England could send to compete against them, failed to elicit any outspoken opinion beyond some expressions on the question of age,—questions, we are glad to see, so well disposed of by "An Englishman in Paris."

How long English noblemen and gentlemen will take a pride in giving almost as much money for a yearling colt as would buy a small estate, and, with rare exceptions, only to incur disappointment, remains to be seen. That radical errors have existed in English horse management, which have become more and more generalised, is a fact susceptible of proof. And equally susceptible of demonstration is it, that where we have been most at fault the French have excelled.

Some of these questions were brought to notice by the renowned sporting writer, Nimrod, five or six and twenty years ago, while he was sojourning in France. Then only few blood horses were produced in France, Lord Henry Seymour's stud, about which Nimrod wrote, being the chief.

We shall continue to look for more of the kind before us from an anonymous correspondent of the *Sportsman*.

THE CATTLE PLAGUE.

To the Editor of the "Daily Telegraph."

SIR,—Some important facts are communicated to us daily with regard to the propagation of the malignant and highly contagious typhoid fever, which is raging with unabated fury. It is approaching some of the finest herds in the country. So far as I can learn the breeders of prize stock have escaped from the fact that they breed and do not buy. One of the choice herds of the South of England has been and is in imminent danger from the purchase of oxen on the Essex Marshes, where the disease has been rife for some time. The animals were taken across the Thames into an adjoining county, and seventeen out of twenty-two condemned and buried; the others slaughtered as not yet effected, and therefore fit for the butcher. The town of Nottingham has had its case. A man purchased two cows a few days back at Ashbourne, in Derbyshire. Derby cows are proverbial for carrying about disease from the great centres of traffic to the farmers who invest in them. One of the cows bought at Ashbourne was left at Beeston; the other taken to Nottingham, where she calved, fell ill on the morning of Tuesday, died in the evening, was dissected early yesterday, and manifested all the signs of the plague. Nine distinct dairies are infected in Edinburgh. And, as usual, a sick cow trucked in Edinburgh was detected with the disease in the Glasgow market, so that we may hear more of the Scotch outbreaks. Indeed, information has reached us of the disease existing in Dumfriesshire, but there is some doubt on this point. So long as we hear of infected, or probably infected, cattle being disseminated in large numbers from the great markets over the country, we must have the propagation of the malady. For the welfare of this country it is deeply to be regretted that our Government cannot deal with this question as Continental authorities do. I regret to say some of our neighbours laugh at our expense. They see us helpless owing to the wretched state of our laws on the subject, and they are not a little amused at the theories of spontaneous development of the disease which some still advocate. The French Emperor has sent over Professor Bouley, who is still in this country, and who telegraphed on his first arrival, about ten days ago, that the ports of France should be instantly closed to British cattle. This has been done, and we may depend upon it the French people will not suffer as we now must. Warnings here are alone calculated to bring those who utter them for a time into ridicule and disrepute. I speak from experience. In 1863 I wrote on this subject to the *Times* on several occasions, and it would be easy to occupy two or three columns of your paper with what I then communicated to that and other journals. In justice to myself, I shall make one quotation, and one only, from a letter dated the 10th of November 1863, and which was published in the *Times*. I said—"If we are receiving Spanish cattle in very fine condition by sea, what

is to prevent a fast and suitably-built steamer landing at a British port cattle shipped at Memel or Libau? Cattle are very cheap in Russia, and the Russians are turning their attention to the management of stock. If we do not husband our resources in the way of producing and fattening animals in the British isles, we must depend more and more on the produce of Eastern plague-breeding plains, and we may find ourselves at no distant period much worse off for animal food than we are at present, notwithstanding every facility being afforded for free trade in stock. Dearly-bought experience has demonstrated to the Austrians, Prussians, French, and others, that the importation of cattle requires constant supervision. Your own correspondents have this year furnished valuable information concerning the cattle plague as it spread through Turkey across the Adriatic and into the Roman States. The area over which this fearful malady has extended of late has been far wider than usual, and it has been found essential on many occasions to enforce a strict quarantine, and otherwise to interfere with the trade in cattle. For the safety of British stock, and for the instruction of British stockowners in general, information concerning the health of animals in different countries should be published periodically; and it would be easy to devise a system of showing the diseased and the healthy regions of Europe in maps, which any cattle-dealer should consult. On such maps the course in which plagues spread, and perhaps even the extent and direction of the cattle traffic, could be indicated. In a short time such a mass of information would be collected as to show how we should act to encourage the trade in healthy animals, and effectually to guard against the traffic in diseased ones."

Had the system I recommended in 1863 been carried out, we should have been placed on our guard with regard to the north-western portions of Russia as early as last November, and we might thereby have had a chance of escape.

I promised in my last to make a statement as to the measures adopted abroad. There are some very important rules laid down which might be beneficially adopted in this country. The concealment on the part of a stockowner of the fact that the plague has attacked his cattle is rendered penal, and the non-observance of regulations subjects the owner of animals to fine and imprisonment from one to six months. On the declaration being made that the disease has appeared in any shed or on any farm, an official inspection is made to ascertain that it is the plague which has appeared. The infected district is then closed for the introduction or exit of stock and the holding of markets, and a check is even placed on the movement of people. Wherever the sick animals have been seen, both sick and healthy are killed. Butchers are engaged to dress the carcases, and those that can be eaten are disposed of, the others are buried five or six feet below ground, and disinfected with chlorinated lime. The thorough cleansing of the stables in which cattle have been diseased is conducted with the greatest precaution, and under supervision.

Charcoal and lime are used on the ground, and boards over this on which the animals lie; all the woodwork is renewed, and in addition to the free use of disinfectants, the walls are frequently limewhited. The antiseptics which have been regarded as of greatest value are those which disengage oxygen, and such agents are most freely used. The transport of cattle occurs in vans or other conveyances under the direct supervision of a competent inspector. Indeed the police are made to accompany suspected animals from sheds or farms to slaughter-houses, and when animals are killed on a farm every precaution is taken that the meat is directly conveyed to a butcher's stall, without danger of being distributed within reach of live stock liable to take the disease. All food, litter, utensils, and other objects which have been touched or in close proximity to diseased cattle, are burned or disinfected. Any fresh animal brought into an infected district or shed must be shown to the inspector, even if only introduced to be slaughtered. If, however, it is intended to be kept, it must be kept quite separate from other stock, otherwise a severe penalty is incurred. Cattle smuggled into an infected district are confiscated. Wherever the disease appears a man is to be employed for the immediate supervision of the animals, and is to be engaged in no other duty whatever. He is to keep the sick under lock and key. No market can be held within three miles' distance of an infected farm. Diseased animals cannot be turned out into fields, commons, or other public places. Whenever suspected animals have to be removed any distance they cannot be travelled on the road, but are removed in railway trucks under careful supervision, and every precaution is taken in disinfecting the cattle trucks by means of water and chlorinated lime. The purchase of dairy stock for the dairies of large towns occurs under special inspection, and the inspecting officer has to keep a ledger showing the names and residences of buyer and seller, and all newly bought cows have to be kept separate for a period of not less than ten days.

The treatment of such animals is discountenanced as much as possible; and this is found of great service in exterminating the disorder. There are special points which should be referred to in connexion with cattle importation, veterinary inspection, and the duties of magistrates; but these I must leave for another time. There are important differences in the laws of different countries; but it is recognised everywhere that the early slaughter of diseased and infected animals, their careful removal, alive or dead, and the most effectual purification of all objects or places with which such animals have come in contact, constitute the basis of legislation.

The report of my speech at the Mansion House yesterday is calculated to mislead the public, and I trust, thererefore, you may afford space for the following corrections.

My comments on the Order in Council specially referred to the fact that in the absence of proper powers—which the Government had tried to secure last year—certain continental measures were

adopted which were impracticable, and calculated to endanger the lives of our animals to a serious extent. The determination to prevent the removal of diseased cattle from any shed without insisting on the slaughter, or providing for the separation of all the animals with which they have been in contact, cannot fail to aggravate the disease. I am aware that Government cannot insist on such slaughter or separation without an indemnity, but surely under the circumstances, and especially in the London dairies, it is easier and safer to remove and separate the diseased than to deal with the infected herds. I cannot understand that there is any greater difficulty in removing a live animal in a van than a dead one.

Referring to Continental veterinarians, I said that some of their remarks might appear interspersed with strange ideas. I quite agree with the Austrian veterinarians that to cure is in this case to kill, because so long as sick and convalescent animals are kept about, the danger of propagating the malady is enormous. Kill by all means, and if you can compensate, kill all that have been near a contaminated animal. I was not of opinion that £200,000 would meet the requirements in London. I said that sum might be spent if a system of mutual insurance was not adopted in addition to voluntary subscriptions from the general public. No such sum as £200,000 is likely to be raised, in my opinion, in this metropolis at present, and no such sum should be called for. I regret that my statements were misunderstood. Twenty-five years ago our stock was, without exception, the healthiest in Europe. It is now, in many districts, as much impregnated with disease as any in the world; and all this we owe to foreign importation conducted without due regard to the interests of this country.—I am, sir, yours, &c.,

JOHN GAMGEE,
Principal of the Albert Veterinary College.

PROFESSOR BOULEY ON THE CATTLE PLAGUE.

EDINBURGH, *25th August* 1865.

SIR,—If there is a question in veterinary medicine of which the solution ought at the present day to be complete and definite, and one which leaves no longer any material for controversy amongst *competent* men, it is that of the orgin, or, so to speak, the home of this redoubtable pest, which has come with such merciless liberality upon the bovine species of England. For long, in the ignorance that existed as to what this disease was in itself, and whence it came, its apparition was explained by invoking the influence of general and common causes—heat and cold, dryness and humidity, privations of all kinds, sufferings, fatigue, overcrowding, accumulation of animals, *&c. &c.*—all causes which are far, in truth, from being innocuous,

but which are powerless to generate the contagious malady known as the *Typhus of Horned Cattle, the Rinderpest*, &c. This has but one home, and that is in the Steppes of Eastern Europe and Asia. There only we meet with the conditions of its spontaneous generation; it is there that its germ is developed, but there exclusively, and nowhere else, however bad may be the conditions in which the bovine species can be kept.

This, Mr Editor, is a truth at the present day known to all men who have studied the question of the origin of the *typhus* upon the historical documents, now so numerous, which treat upon this ruinous malady; and if anything can astonish us, it is that a question of this nature yet gives place in England to so much controversy.

The typhus is not a new malady in Western Europe. It has visited us too often, notably in connexion with the transit of large bodies of men, as necessitated by wars, and which imperatively demanded the simultaneous removal of cattle—the one never marching without the others; and at each of its visits, history testifies that the invasion is to be attributed, it may be to animals, or it may be to the *debris* of animals, brought from Eastern Europe.

Those who do not wish to admit the exotic nature of typhus, invoke, to explain its outbreak, the influence of habitations, faulty hygienic conditions, privations, sufferings, heat, &c. &c.; but they do not reflect that these causes exist at all times and in all countries, whilst the typhus does not appear but on extraordinary occasions, and afflicts only some unfortunate or imprudent countries. If the typhus depended on the bad condition of the byres in which milk cows are kept, it ought to reign perpetually among the dairies in Paris and its suburbs, where the unfortunate beasts, destined to the production of milk, are maintained in low, humid, suffocating stables, without light, and without air. Compared to the cow-houses of Paris, those of London are Louvres; and nevertheless the typhus does not break out in those. Since the inauspicious days of 1814 and 1815 we have not had it in France, and it is 110 years since it last visited England.

Is it the case that during the century just passed the cattle of Great Britain have not suffered from heat, have not been kept in unhealthy buildings, have not been maltreated by travelling or on voyage—have not, in short, been submitted to thousands and thousands of causes upon which it is argued to explain the actual invasion of this malady? And, nevertheless, a whole century has passed, and ten years more with it, without the typhus appearing to have met with the local conditions of its development in England.

It is the same in France, in Spain, in Italy, and in Germany; there also reign those causes, general and common, which are supposed capable of generating the typhus, and, notwithstanding, it does not appear; and when it shows itself it is when commerce or war have caused the removal and emigration from their native country into

other lands of animals which come from localities mothers of the typhus.

We have now ceased to believe that this malady is able to be indigenous. England, by the blessing of God, has not the sad fecundity which has been attributed to her. The earth of her green pasturages does not conceal within it, like the putrid soil of the Steppes, a germ of death for the animals which breathe its emanations. Old England is, and will remain, the favoured mother of those beautiful bovine races which are one of her glories; but on the condition that she knows to defend herself against the invasion of animals of the Steppes, or at least that she will not open her ports, except when she has had testimony, by a sufficient quarantine, that they are clear of all infectious principles.

This is the safety of England. If she adopts the fatalistic doctrine that the typhus, to the infliction of which she is now subjected, is an indigenous malady, she will see her bovine population disappear, as in Egypt; but this doctrine is false—radically false; and one thing only excuses those who sustain it. It is, that they speak of that which they do not know. Yes; but where is the excuse for their speaking?

The real truth, that against which all the errors will not prevail, from whomsoever they may come, or by whomsoever they may be sustained, is this, that the typhus, which has fallen like a curse on the flesh of horned cattle, has been imported into England by the convoy from the Baltic, and that it is spreading by virtue of its contagious properties, which are of the greatest possible potency. If England had not been disarmed by her laws, it had been possible to have arrested its march by energetic measures like those adopted on the Continent, where the Austrian and Prussian sentinels, always vigilant, guard Western Europe, and protect it against the invasion of this Russian scourge. But in England, as it appears, *the bovine race must perish rather than a principle.* The maxim is sublime, no doubt, but it will be productive of very great disasters.—I am, &c.

H. Bouley,

Professor in the Imperial Veterinary School of Alfort, delegated by the French Government for the study of the Contagious Typhus.

PERISCOPE.

THE CATTLE PLAGUE.

A MEETING of Metropolitan Cowkeepers was held on Monday, the 31st July, at the Marylebone Institution, Edward Street, Portman Square, London, for the purpose of considering what measures should be adopted with reference to the prevailing malady which had recently been imported among cattle in London.

The meeting, which was largely attended, was presided over by J. P. Dexter, Chairman of the London Cowkeepers' Association.

The CHAIRMAN—Gentlemen, I feel I need make no apology for having taken the liberty of calling you together on the present occasion. I think the circumstances are such as to demand that some effort should, at least, be made upon our own part to help ourselves, as well as to secure that sympathy and assistance which I own, if we help ourselves, we will best obtain. I have called you together in consequence of the recently introduced disease among cattle, termed—and very appropriately—the "*Cattle Plague.*" Individually, I am ignorant altogether of its character—an ignorance which I hope I may personally retain, and in which I hope many of those present share; but still we are all aware that that ignorance is not universal. We know that some in London have already very severely suffered from its ravages. We know that reports have reached us of certain individuals, whose names I shall not mention, for their sufferings are quite sufficient, without proclaiming them throughout the length and breadth of the land, having lost many cattle by this disease; and what has been the fate of one to-day, may very likely be the fate of others to-morrow. There are influences at work which will probably tend to extend this disease, and I think it becomes us as tradesmen having a large personal stake in the matter, and also a great interest in the country, to meet together for the purpose of seeing if anything, and what, can be done to prevent the advancement of so fatal a disease. You are aware that for the last quarter of a century the cowkeepers of London have had very serious difficulties to contend against. About the commencement of that period and since, we have suffered from what is ordinarily called the lung disease, and the foot-and-mouth complaint. I prefer the common terms by which these diseases are best known to the trade. Now, from that time to the present, we have been scarcely thoroughly free from that disease; and here I may remark that that which has no doubt been a great advantage to the community at large, has been a very great disadvantage to us, inasmuch as both these diseases from which we have suffered so severely, have been the result of the importation of cattle from foreign countries. However, I think I may say that both those diseases have been materially modified of late years by the general adoption—and I believe the adoption is general—of preventive measures. Few cases now occur of lung diseases, and the foot-and-mouth complaint is, as a general rule, of a much milder form than it formerly used to be. However, just as we were beginning to congratulate ourselves upon this improved state of things, and upon the greater chances of our success, another disease of a far more fatal character than either of those I have mentioned sprung up in our midst. Wherever it has manifested itself, its ravages have been of the most fatal nature. I have heard of instances in which all, or very nearly all, the stock has been carried off. I have also heard that cattle suffering from this disease have been exhibited in our markets. I am aware that we must study very well what measures we should adopt, if we wish to act prudently and wisely. The Government, you know, have already taken the steps which they deem necessary. They have issued a circular requiring every one of us, as circumstances may occur, to send them an account of any animals we may have diseased. Whether that will be a sufficient degree of protection against the extension of the disease, remains to be proved. But I think that in the meantime, at any rate, we should do wisely to take the matter into our own hands, in order to see whether the trade, collectively, cannot help themselves, better than the Government can help them, or, at least, whether by any measures of our own we can so co-operate with the Government as to prevent the advancement of the disease. (Cheers.) You all see on this platform, and perhaps most of you know, Professor Gamgee. He will give us a full account of this disease, which he has made the subject of his special study, and will further suggest for our adoption such measures as he thinks advisable to mitigate and prevent the extension of its ravages. (Cheers.)

Professor GAMGEE, who then came forward, was received with loud cheers, said—Whenever a great evil exists, it is the duty of all whom it concerns to try and fathom its origin and its nature, with a view to its removal, with the least possible loss of time, and with the least possible sacrifice in various ways. You have been informed, by your chairman, that this meeting has been convened in order to ascertain what can be done under very extraordinary circumstances, which, I must say, although they had been foreseen, unfortunately we are entirely unprepared for. (Hear, hear.) You know that owing to the rapid destruction of British stock for many years past, and the growing wants of the community by increase of population, there has been a rapid advance in the number of cattle imported; and the condition of the stock so imported, especially in point of health, has not materially improved, but in many respects has actually deteriorated. So obvious, indeed, has been the state of stock as it came from the Eastern parts of Europe, to our own shores—so apparent was it that many of our animals must sustain injury by coming in contact with those from Poland, Hungary, Austria, and Prussia—that we have for some time foreseen the sad evil which has now befallen us, and against which some very radical measures must be adopted with a view to relieve the nation from any serious loss. (Hear, hear.) The Russian cattle plague, which is now in the dairies of London, is one of those purely contagious disorders, which is alone communicated by contact—alone communicated to the healthy by the diseased. It, therefore, never could have come here except through direct communication with the regions where the disease may originate spontaneously—the Western parts of Europe, beyond the Russian frontier. It is a fever; it is called *typhus—the contagious typhus of cattle.* It is true there are many synonyms; we have a variety of appellations; but the term that has received the greatest acceptance amongst scientific men generally, as indicating most accurately the nature of the disease, is that of the contagious typhus of cattle. That it is contagious typhus the cows of London are now suffering from, there can be no doubt. This point is established by those who have seen the disease elsewhere; and within the last three days I have seen a number of cases, and made several dissections, which have satisfied me that the disease is amongst us at the present moment. One feature of the malady is its tendency to spread. Wherever there is contagious matter, it can be carried away, and it spreads with unerring certainty, affecting cattle of all ages and both sexes, and under all conditions, whether in the cowshed or in the open field And strange to say, the disease is peculiar to the ox tribe; but it may not only be communicated directly by herds of cattle, but under certain circumstances by flocks of sheep, for they may undoubtedly carry it with them whether they be affected or not. I will not detain you by going into any general remarks. To-night our object is a special one—to aim at some practical result; and if you will allow me, I will state briefly the result of *post-mortem* examinations of some animals that have died from the disease; then I will mention some other cases of the disorder; and lastly, I will allude more particularly to the means we *must* adopt, if we wish to remove the plague from this land. With regard to the symptoms of the malady, we find that within six, seven, or eight days—sometimes within three or four—but never beyond ten days, after the introduction of a newly bought animal, the disease appears—that is to say, an animal which has been in contact with one affected with this Russian plague. I repeat that the signs of the disease always manifest themselves within ten days. In technical language, that is the period of incubation. It is doubtful whether animals, while in this stage, can communicate the disease, though it is asserted that animals which have gone through the disease once, and are never liable to a second attack, may carry in their skins, or the surfaces of their bodies, poison capable of contaminating any number of herds and destroying thousands upon thousands of heads of cattle. When affected the animal gets dull and prostrate, has a drooping head and closed eyelids; shivering fits come on; there is costiveness, the urine is of a high colour, the eyes red, mouth hot, and the thirst intense. These are the premonitory symptoms which unmistakeably indicate that the animal is ill. These symptoms are in no sense characteristic of the disease. They may occur under other circumstances, and in any fever, but when you know that the disease is in the country, and that animals are being cut down by it, when the slightest sign of any such affections, or of any febrile disease arises, it ought not to be disregarded. Within a couple of days at the outside, you will find whether the malady is contagious or not. The symptoms that follow are violent tremblings, peculiar spasmodic tremblings of the muscles, discharges from the eyes and nose, abdominal pains, costiveness and diarrhœa, and sometimes blood tinges the excrements. The surface of the body is cold, the legs are cold, and the ears are

hot. These alterations of temperature are constantly observed. Then there are violent tremblings and twitchings, and a tendency to convulsions and spasms. The animal has a dull, listless, stupid look, as if it did not know what to do. There is also considerable depression and loss of power in the extremities. We find that this, the second stage, lasts between two and three days, and we have in this disease, as in other fevers, a crisis, a period when there occurs some remarkable change in the condition of the animal. This crisis is manifested by irruptions in the body, mouth, and nose, by no means favourable symptoms but rather signs of obstructions in the whole system, and of a great increase in the severity of the disorder. The animal manifests considerable tenderness and a disposition to weakness, which may afterwards result in absolute paralysis, and all the symptoms of ordinary fever are coupled with these special symptoms. In the last stage there is evidence of serious blood changes manifested, especially through the nervous system, and the animal becomes completely paralysed and dies in convulsions. I do not wish to enter into any lengthy technical discussion on the subject, but merely to convey to you in as few words as possible the nature of the disease. The animals are speedily reduced when they are attacked with the disorder; they become rapidly emaciated, their flanks sinking in, and with these signs you have constantly death. In some cases death occurs in two or three days; in others, in a week. Some even do not occur for three or four weeks. When once attacked they never rally, though they sometimes afford some slight hopes of recovery. When the animal is examined after death, we find most of the indications of typhoid fever in man. There are peculiar changes in the bowels, and certain glands (the agminated glands) undergo an alteration. But there is, however, this broad line of demarcation between typhoid fever in man and the cattle plague, that the latter is essentially a pest propagated by contagion, whereas typhoid fever may be produced by local causes, such as defective sewerage, which, under no circumstances, can produce this disorder in cattle. Changes also occur in the tissues of the body which serve to distinguish this disease, the cattle plague, from the fever in man, and they are these—that instead of the malady appearing as localised in the bowels, we have eruptions upon the nose, a peculiar condition of the membrane lining of the air passages, and the lining of the mouth, and it seems to be more or less of a catarrhal nature, with running at the nose and running at the eyes. The discharge is very peculiar. It must not, in fact, be treated as a discharge in the ordinary sense of the word, because every drop of matter that falls from any part of the body, and all the exhalations from the skin, are charged with a specific poison. This renders the discharge so peculiar in itself, and makes it like the lymph in the small pox, a certain means of propagating the disease. In this cattle plague the tendency of nature is to get rid of the poison, which, however, as a rule, is so potent that it destroys life without any chance, on our part, of saving it. Then, we observe that this discharge is peculiar in its physical properties. A thick dense gluey matter is found in large quantities in the intestines, and very often mixed with the blood, and we sometimes see it oozing out of the different membranes of the body, nature making an effort to get rid of the poison. We find in this disease a brown coffee-coloured material of a fœtid nature thrown off, and in the majority of cases there is a disposition to free secretion, and not only the discharges, but the fumes from the body are decidedly contagious. You may say, "If this malady is so fatal and so easily communicated, how is it that we have never had it before." Now, it so happens that we had the disorder among our cattle last century, when our ports were open for the importation of cattle from abroad, but at that period the importation was so small that it was not of much importance. The disease appeared in Holland, and came over to this country and caused severe losses. During the last few years the malady has been raging much in Europe. During the last twenty years it has been raging more or less in Hungary, Lower Austria, Moravia, Bukowinia, Silesia, Bohemia, and other places too far westward to be comfortable to the more westerly parts of Europe. Some men of scientific attainments were sent to inquire into the matter, but it so happened that the disease was not so bad as the cattle plague, but the mouth and lung disease, and in this way we were rather heedless of what followed. It was, however, clearly foreseen if the trade with the East continued and increased, it would be impossible to avert the introduction of this disorder into the British Isles. It entered Italy last year, and appeared in Smithfield Market this year. It ravaged the stock in Poland, and the Austrian dominions, and it was evident that its chances of approach here were many. There were circumstances which might have foretold its coming; for instance, persons sending cattle here must have known that if any of them were affected,

or had been in contact with those suffering from the disease, they would in all probability communicate it to others, and they ought to have avoided exporting them. There was, however, another ground for hoping that the disorder would not reach us. Owing to the manifest character of the malady, and the energy of the Austrian and Prussian Governments in limiting the outbreak to those places in which it had occurred, we trusted that we might hear no more of it. We have, however, been disabused of that hope; and some years ago my own idea was, that there was a great probability of the disease coming to our shores. This is what I wrote upon the subject:—"The vigorous measures adopted in the countries bordering on Russia to arrest the plague effectually prevent its spread; nevertheless, European wars, which it is hoped may never again prove as general as during the last century, may lead to another invasion of this most disastrous epizootic."* And again, "If Russia became engaged in a war with Prussia or Austria, and our import trade continued as at present, I think it would be impossible to avoid an importation of this terrible disease. We must not forget that it appeared in Turkey and in the Crimea during the Crimean campaign. Its outbreaks then was only in accordance with the circumstances under which similar outbreaks occurred last century, as well as this one, and similar circumstances endangering this country still more may again recur."† Now, you understand that there can be no doubt of the disease having come here. Herds of cattle in a diseased condition, travelling from Hungary, Austria, Prussia, Wallachia, and other parts, have come to our markets by way of Yarmouth, Lowestoft, and various other parts of this country; and not only that, but they have infected the very ships in which they have been conveyed. (Cheers.) As I have already said, there can be no doubt that the disease may be conveyed indirectly, but there is no fear of its being conveyed in people's clothes. It may certainly be conveyed in the hides, skins, hoofs, and horns of cattle that have died from it, but as a rule, some more definite cause operates in communicating the contagion to cattle. Whole herds of cattle may, however, become affected by the imperfect way in which ships are washed, and the very dirty state in which the cattle-trucks on railways are kept. (Hear, hear.) We know that the discharge from the diseased animals, from their eyes and noses especially, will stick in any quantity about places, and retain its poison even when in a dry state. And in cases of that kind the result is precisely similar to what would occur if you put a glandered horse into a stable. You have the discharge from him dropping about the manger and walls; and though you may put a horse in the same stable a week or so afterwards, when the discharge has dried up, that discharge will still retain its poison, and the animal may be seized like the first. In this way the disease may easily be propagated. As an admirable illustration of the manner in which such discharges may communicate disease over a long period, I may mention the case of the large Irish bacon factors, who buy 300 or 400 pigs at a time, and when one lot has been purchased affected with the foot-and-mouth diseases, every succeeding herd of swine placed in the enclosures destined for them contract the malady. They suffer severely; and at all times of the day and night, the people are obliged to cut the throat of first one and then another, in order "*to save their bacon.*" (Laughter.) This shows how disease may be propagated; and even the poison may adhere to a healthy animal which is never attacked, and yet by it be communicated to others. It is a consoling circumstance, that whereas we might occasionally, by our clothes, communicate the disease to cattle, though I do not think that probable, we cannot suffer from it ourselves. Were we to add to the ordinary terrors of the cattle trade the idea of its being communicated to man, we would create a panic in the country far more readily than it seems possible to create one at the present moment, even by such occurrences as those now under consideration. But whereas, as human beings we are not directly affected, I wish to impress this strongly upon your mind, that when either by mismanagement or ignorance, either by circumstances evitable or inevitable, the available amount of animal food is going on diminishing; and people are obliged to eat less meat themselves, and give less to their children, and we are being told that we shall have to turn vegetarians—I say that when this happens, you have an independent source of disease in man of the most serious character. It is strange that after an extensive outbreak of a contagious cattle disease, as for instance that in Egypt in 1863, an outbreak of some complaint or another usually takes place among men. When such an epidemic among the

* "Dairy Stock," page 139. By Professor Gamgee.

† "Our Domestic Animals in Health and Disease," page 260. By Professor Gamgee. Edinburgh: M'Lachlan & Stewart.

people occurred in Ireland, the Registrar-General seemed to think that the atmospheric influence had operated in some mysterious manner; but effect follows cause with the greatest certainty. If you get a disease cutting down stock and bringing it into the market, at one moment giving a superabundance of deteriorated food, and at another moment diminishing the supply of food for the people, you must inevitably have disease introduced among men. I will not say contagious typhus, but some form of disease, especially if the malady in cattle is permitted to obtain any vast extension in the country. I will now draw your attention to a few statistics with regard to the ravages of the diseases amongst cattle in the last century:—

"In 1745, it laid Holland waste a second time. More than 200,000 cattle now perished. In the same year it again found its way to the coast of Britain. It seems to have been clearly brought to us from Holland, although there are two versions of the story. Dr Mortimer says that it was imported by means of two white calves, which a farmer at Poplar sent for, in order to cross his own breed; and that it spread into Berkshire by means of two cows that were brought out of Essex. The other account is, that one of our tanners bought a parcel of distempered hides in Zealand, which were forbidden to be sold there, and should have been buried, and thus he transplanted this dreadful disease here. 'Thus by one man's unlawful gain,' says Mr Layard, 'if by this way it was conveyed, the ruin of many graziers and farmers was effected.' It is certain, however, that the pest first appeared in the immediate neighbourhood of London, and on the Essex side of the river, and that thence it gradually spread through Essex and Hertfordshire, and the whole of the kingdom.

"For more than twelve years it continued to lay waste the country. The number of beasts that were actually destroyed by it was not, and perhaps could not, be ascertained; but in the third year of the plague, when the Government had so seriously taken up the matter as to order that every beast that exhibited the slightest mark of infection should be destroyed, a remuneration being made to the owner, no fewer than 80,000 cattle were slaughtered, besides those which died of the disease, and which formed, according to the narration of one of the commissioners, nearly double that number. In the fourth year of the plague, they were destroyed at the rate of 7000 per month, until, from the numerous impositions that were practised, this portion of the preventative regulations was suspended.

"In the year 1747, more than 40,000 cattle died in Nottinghamshire and Leicestershire, and in Cheshire 30,000 died in about half a year.

"The plague wore itself out in the course of ten years in some parts, but it lasted for more than thirty in others, and in spite of the wisest counsels proffered by the learned of all Europe, 3,000,000 head of cattle were cleared off. Twenty more years passed over, and cattle breeders prospered; they accumulated stock to feed the pestilence of 1770. The disease which Youatt refers to as appearing in France in 1757 is not the contagious typhus; it spread from west to east, instead of from east to west, and was not limited to the ox. In 1770 and 1771, the true cattle plague again entered Holland, and the ravages it committed are described as terrible in the extreme. In 1769 and 1770, it carried off 98,000 animals in the one province of Frisia; and in the south of Holland, during one year, 115,665 head of cattle met with the same fate. During the same period, and in the north of Holland, the disease attacked 225,831, of which 162,276 perished, so that the total loss in Holland alone during one year amounted to 375,441.

"From Holland the disease penetrated Austria and French Flanders, reaching Laon, and only the provinces of Artois and Picardy, where 11,000 animals also died. Paulet says, scarcely had Flanders and Picardy repaired the loss of their cattle, when, in 1773, the murrain manifested itself in Hainault, and with renewed vigour in Holland. The epizootic destroyed the cattle of Flanders, Picardy, Soissons, and Champagne, but the loss, says Delafond, was not estimated at this period. From the year 1740, the southern provinces of France, stocked with cattle as at the present day, were spared the bovine pest, when in the month of August 1774, this malady, which was devastating Holland and Picardy, broke forth on the borders of the ocean at Bayonne and its environs, and almost exterminated the cattle of many French provinces. The number of animals that succumbed was 150,000, and these worth 15,000,000 francs.

"The contagious typhus followed Napoleon into Italy in 1793, 1794, and 1795, and Buniva tells us that in three years Piedmont lost from 3,000,000 to 4,000,000 head of cattle. In 1796 it broke out amongst cattle of the French army's escort on the borders of the Rhine, and as it was not looked upon as contagious, it spread with fearful rapidity to all the horned beasts of the Lower Rhine provinces. It entered Switzer-

land, and returned into France by Burgundy, reaching near to the gates of Paris. Only in the circle of the Lower Rhine the mortality amounted to 11,047, and in the twenty-seven departments of France to which it spread, 130,000 animals died, and their worth in money amounted to 12,000,000 francs."*

Now, we are really on the brink of a calamity which may obtain the dimensions of that which visited this country in 1745. It is impossible, of course, to calculate what will be the result. You may depend upon it, that hundreds of thousands of pounds sterling must be inevitably lost, because we are thoroughly unprepared to cope with such a plague as this in the United Kingdom. Before I proceed to show you what should be done, allow me briefly to read a statement as to how far the outbreak has extended up to the present time:—

"The first appearance of the malady, so far as it can be at present traced, dates back to June 27th, when six cows which had been purchased on the 19th in the Metropolitan Cattle Market, were seized with the disease in Mrs Nicholl's dairy, 15 Park Place, Liverpool Road, Islington. Circumstances favoured the spread of the malady, as, although the six cows were placed in a quarantine shed, other cows happen to have been in the same place, and thus the malady was propagated—115 have died.

"It is impossible now to give the succeeding outbreaks in order of time; and without specially naming the cowkeepers, I may mention that the malady has been and is more particularly confined to the districts of Islington, St Pancras, Marylebone, and Paddington. It is at the present moment raging severely in Marylebone, at Kilburn, Hendon, Hampstead, and Sydenham, and also it is said at Cheam, Surrey.

"Since Saturday I have received information directly and indirectly, but chiefly from personal inquiries, concerning twelve distinct outbreaks. I shall state the particulars in the order in which I have gleaned them.

"1. The first shed I visited was in Marylebone. Forty-five animals, in apparently the most perfect health, were in this yard on Thursday the 20th. The owner had been to the Metropolitan Cattle Market on the 14th, or thereabouts, and was shown some cattle labouring under the disease. He approached them within a yard or two, but feared to touch them. Within a week, viz., on Friday the 21st, he noticed some of his animals sick, and saw they were labouring under the disease he had witnessed in the market. On Saturday he began to get rid of them, and sold twenty-eight by Tuesday the 25th. The remainder of the stock was turned out in fields, I know not where, and is said to be still healthy.

"2. A cowkeeper in the immediate neighbourhood of the last one had sixteen cows in perfect health, and lost the whole in a fortnight.

"3. In an adjoining street a third dairyman had seventy cows distributed in various sheds, besides seventy in the country. A cow was bought in the Metropolitan Cattle Market on the 10th of July, and on the 16th this animal showed signs of the disease. She had been placed in a shed with twenty-three others. Twelve were fat, and were sold in the market before any sickness manifested itself on them. The other twelve were seized, including the newly-bought one, and of these eight have died and four are still living, but not all likely to recover. As yet, the remaining stock in distant sheds is in perfect health.

"4. An extensive cowkeeper with a choice stock of seventy cows, purchased a Dutch beast nearly a month back. Within a few days it was affected, and the seventy animals were all seized within a fortnight. I saw three convalescent on Saturday, but in a very reduced condition.

"5. Near Cumberland Market a dairyman, having usually between forty and fifty cows, lost the whole within three weeks.

"6. Another dairyman in the same neighbourhood has the disease amongst his stock at the present moment.

"7. In St Pancras a dairyman has lost ten within a few days.

"8. A cowkeeper in Camden Town had a stock of sixteen cows in perfect health in the early part of this month—they all died in a fortnight. He fumigated and otherwise disinfected his shed and bought six fresh animals, of which two are already dead.

"9. Near Willesden a dairyman has lost sixty-five animals within a fortnight.

"10. At Kilburn, one dairy has been and is suffering most severely.

"11. Near the Edgeware Road I saw this day eight diseased animals, some in a fair

* "Dairy Stock," p. 115. By Professor Gamgee.

way for recovery. They were the remains of a stock numbering eighteen or twenty, which was in perfect health three weeks back.

"12. An extensive dairyman at Hampstead has been sending diseased cattle to the horse-slaughterers, but I know not the number. The same has occurred from some cattle pens near Sydenham.

"Yesterday, I saw several animals labouring under the disease, and dissected part of three at Atcheler's.

"It appears that, during the last three weeks, many animals, exceeding probably fifty a week, have been sent to Atcheler's, until the place was so full of them that they had to be refused admission. They have, therefore, been taken elsewhere, and disposed of as best could be managed. The Metropolitan Cattle Market has certainly had in it infected and diseased cattle every day that a market has been held during the month of July.

"Few persons have had their cattle treated. Some have been encouraged by success, but the majority dread any professional or Government interference, and consider their ruin would be hastened if they exposed the true position of matters, and submitted to the enforcement of any measures yet proposed. There is a total disinclination to replace lost stock, and some are resolved not to buy cows again,—at all events, for a considerable period of time.

"The malady has broken out in various parts of the country, but as yet no accurate information, to be relied upon, has been obtained."

Since the last week in July, about 2000 head of cattle have died in London and its neighbourhood. You may say, "We have not lost any such number," but upon a careful consideration of the facts I have already ascertained, and considering the secrecy which is observed by persons in the trade with regard to the cattle which they may have had seized with this disorder, and also the great jealousy which is evinced to Government interference, I believe I am within the mark when I say that 2000 have died within the last month. The Metropolitan Cattle Market has a good deal to answer for with regard to the introduction and propagation of this disease. That is a fact I can bear witness to from my own observation. On Sunday I visited the market, and I had occasion to examine some diseased animals, and I also witnessed other animals proceeding to the market. The present outbreak, as you are aware, is more or less confined to London. It has already appeared in the parishes of Islington, Paddington, St Pancras, and Marylebone, and it is gradually getting over the water; it is also getting to Hampstead and Hendon, and, in fact, spreading all round. The circle is gradually enlarging. This is inevitable, because there is ample evidence of diseased cattle having been sold in the market, and getting freely into the trade. I understand it has been seen in Yorkshire and Warwickshire, and in the course of a few days, you may have outbreaks in various other directions. It is impossible to calculate what the loss will eventually be, but the calamity is a truly national one, by no means inferior to the recent cotton famine. The point for our consideration is, How shall we avert the impending loss? That is the practical question. I think it is quite evident from the past, *that the Government cannot help us.* I don't know that we ought to be sorry for it, because there is a British way of dealing with all such difficulties. When there is anything very great to be done in the country, it is done by the *people*—not by the people individually, but by the people collectively. It is true that at first sight we find ourselves surrounded by apparently enormous difficulties, and there is a disposition amongst us to try and rest upon some prop or another, and, that being so, the term "Government" is found to be a very convenient thing. There is not the slightest doubt but that what are called "paternal Governments," have done their duty in this matter. The Emperor Napoleon, the Emperor of Austria, and the King of Prussia, concerning whom things not very complimentary have been said of late, have an organisation which enables them to assist their people. Though, however, individuals scattered about in London and the provinces, cannot help themselves, the people collectively may do a great deal. The Government cannot help you because they have sought for certain powers to enable them to control the spread of contagious disorders amongst cattle, and those powers have not been granted to them. That is really at the bottom of the whole affair. If the Government had had ample powers, I don't mean to say they could at once have done marvels, but they might have done something. However, it would have been utterly useless for them to have attempted enforcing any act which at present exists. The little act passed in 1850 renders the Government powerless. When it was suggested that they should do this, and that, and the other, the legal officers of the Crown said it was illegal. The Government have no law sufficient for the pur-

pose, and without it they are perfectly powerless as regards assisting us. It is true that they have got plenty of money, and the question of indemnity may arise; but when the cotton famine happened, it was not by drawing from the National Exchequer that we met the difficulty; it was by the free and voluntary effort of the people at large, guided, it is true, by information collected by the Government. Abroad this is what happens. Wherever a disease appears, the district veterinary surgeon—who is paid for the prevention of disease, and that is what he should be paid for, for we cannot afford to pay for treating diseased or dying cattle, but we can, if we have proper organisation, keep disease from you. That has been my doctrine all along. The district veterinary surgeon abroad, I repeat, takes the proper precautions for the instant suppression of the malady. If it is contagious, he surrounds the point and prevents any cattle going beyond it. The cattle affected are killed, and the Government pays for them, and pays so liberally that the owner voluntarily gives information at once as to the state of his stock; and if he does not do so he forfeits a penalty to Government. The premium held out to honest, open dealing is very large, and thus it is that the disease cannot exist in Prussia and Austria for an instant, without being instantly known and instantly dealt with. In these countries the most remarkable activity is shown in preventing the progress of the disease. They usually adopt the process of slaughter. It is true the Russian Government have introduced inoculation, but the safest practice is that adopted by the other countries I have mentioned, of cutting the animal's throat, and burying its body below the ground, and disinfecting its hide, horns, and those other parts which it may be desirable to sell, in order that all means of propagating the infection may be destroyed. I now come again to the point—What shall we do? It is not by fining people, and threatening others, that we can bring them to work for their own good and the good of others. It is by securing the hearty and warm co-operation of all. I believe the only way in which the whole thing can be properly dealt with is that adopted on the outbreak of small-pox among sheep in 1862. On that occasion, sheep were affected to a fearful extent, and the disorder spread rapidly. I was engaged by the Privy Council to make inquiries into the diseases of cattle, in relation to the supply of food. I went to Wiltshire, where the disease was raging, and on visiting Devizes, I found that the people interested in the matter were frightened of each other—that they were trying to smother the whole thing, while the disease was rapidly gaining ground, and tending to increase their probable losses. I informed them that it was not by secrecy, by deceit, or by lying, that they could control this national calamity, but by open, above board, honest and plain dealing—that they ought to put money into a common purse to pay for any animals which died from the disease, or were killed in consequence of their being affected by it, and to enable them to be buried at once. Under this open and candid system, the disease was rapidly dealt with, and in three weeks it disappeared from the North Wiltshire Downs, while before it was rapidly propagating itself, and daily adding to the number of its victims. The proper way then to begin is for the trade to protect itself, and to do so through the machinery of an association, having in view the prevention of this disorder in cattle. Let a provisional committee be appointed; let it meet and consider what should best be done; let it keep its own secrets, and let it be entrusted with the secrets of the trade. You can surely trust yourselves. Let there be some qualified and well-known person employed to cope with the difficulty, according to the well-known means for the prevention of plagues. I wish now to state the proposition, which I think ought to be submitted to your consideration. It is this—

"That this meeting consider it absolutely necessary that the proprietors of cattle throughout the country should combine for their mutual protection; and that a society should be formed, entitled, 'The National Association for the Prevention of Cattle Diseases.'"

I believe that if the matter is worked well, funds will be obtained to a considerable amount to carry out the project. I also think the system of mutual insurance might be adopted at an early period. There is a difficulty, no doubt, as to this subject, because people are so selfish that they will not pay a premium until their cattle get diseased; but if there is a hearty co-operation throughout the country, it will be found that the proportionate loss over the whole area will be very small, and a system of mutual insurance would meet the case. Another matter to ascertain is, how to best supply fresh animals for those which have been destroyed, and with a little vigorous action, something may even be done in this respect. This is a very important question. An association such as I propose cannot become, all at once, a commercial one, and deal in stock; but it is possible to obtain from certain districts healthy stock to

take the place of that which is condemned as diseased. The difficulty of obtaining fresh stock will not, I think, be so serious as some imagine, especially as the London season is now nearly over, and the demand upon cowkeepers by the public will not be so great. My proposition is, *that the many should aid the few*, instead of people fighting against each other. (Cheers.) It may be said, Why have you not found a cure for this disorder? There is a great fallacy in connexion with all these diseases. The public want at once a specific to meet the case; but it so happens that in all these instances the poison gets into the system of the animal, and then the animal is as dead, to all intents and purposes, as if he had been struck by a pole-axe. Probably we shall never discover an antidote for these diseases. If a man takes arsenic, or any other mineral poison, we can at once apply a remedy; but when this animal poison gets into the system of a cow or other animal, we cannot extract it nor neutralise it. We have no antidote for animal poisons. You must not look upon scientific men as ignorant if they cannot discover a cure. It is not in the nature of things that they can find a cure; but with regard to prevention, we must adopt means whereby diseased animals shall be kept apart from healthy stock, and our cattle markets freed from any means of propagating the disorder. Wherever the disease occurs, there must be thorough disinfection, and every effort made to limit it to the locality in which it has appeared. I believe if the association is formed, it will have some influence upon the Government, even to the extent of something being granted from the national exchequer for losses which have been sustained, while I believe that subscriptions will come in from every part of the country; but this will depend upon your setting an example yourselves in this metropolis. It is only by energetic, active, and straightforward conduct in carrying out measures of self-help that you can do any good upon this subject. You all remember the words of Oliver Cromwell, "Trust in God, and keep your powder dry;" and that injunction applies with great force to the present moment. We trust to Providence to help us in this great calamity; but we shall best entitle ourselves to that help, and to the sympathy, co-operation, and assistance of the public, by trying, in the first instance, to help ourselves. (Cheers.)

Mr Delano (Tottenham) asked if a diseased cow purchased in Smithfield Market would contaminate healthy cows in the same shed?

Professor Gamgee—In several cases I have investigated, cattle purchased in Smithfield Market have conveyed the disease to others. In all the countries where the disease has appeared, the people are agreed upon this point—that it is a purely contagious disorder. You cannot always say how it has been caught: just as when a man is attacked with small-pox, he is unable to state how he got it, but medical men will tell you that it was impossible he could have that complaint unless he caught it. This particular disease amongst cows never came here until after this extraordinary importation of cattle. It is entirely foreign; and we find it first appearing in the metropolis, where the importation is so vast, and it is gradually spreading around.

Mr Delano—If that is so, one great check will be, to advise cowkeepers to do as I have done myself. I won't buy any cows at Smithfield, and I won't allow a Smithfield cow to come within my sheds or farm. I am sorry, however, to say, that many persons in my neighbourhood have purchased cows there, and taken them down into the country. God only knows where all this will end. If the disease were confined to Smithfield, there need be less apprehension; but we know that it is not so. I have made up my mind not to have a cow from Smithfield for some time to come. My advice to cowkeepers, who have bought any there since the 27th June, when the disease first appeared, is, that they should get them out of their sheds at once. At present I have not had the disease in my sheds, nor in my place in the country; but within a mile of me it has affected a stock, and I think that can be traced to Smithfield Market. I am glad to hear you say that defective drainage does not promote the disease; but a great improvement has taken place in that respect during the last few years. It is true that the mouth and lung complaint has been gradually disappearing, but up to the present time we have discovered no remedy for it but the act of Providence. Now, this disease is not so bad by fifty or sixty per cent. as it was a few years ago. You say that this new disease may be conveyed in people's clothes. If that be so, and the Government appoint inspectors to go into the various sheds, I shall close my doors against these inspectors. (Laughter.) Do you think I shall allow a veterinary man, who has been handling diseased cows, to come into my shed and contaminate my cows? (Laughter.) That is really a rather serious matter. It is stated that the Government have already appointed several inspectors to inspect the cow-sheds in the metropolis; but whether true or not I cannot say. You say

effect follows cause. Now, we cannot tell the cause in this instance. In 1745 the difficulty was to find a cure for the disease which then prevailed among cattle; but in 1747 the Government came forward and paid the losses of the cowkeepers; and I think in the present case they have a right to go again to the Government. Look at the serious loss they are sustaining. Really the Government ought to take the matter up. Of course, if any plan can be devised for arresting the evil, I will readily fall into it. You say we are totally unprepared; but what preparation could we have made? What can a man do, if he has got a diseased cow, but take it away; unless he kills it, and then there is the loss, no very pleasant thing: but I suppose that must take place. This is a very serious matter indeed, not like the small-pox amongst the sheep in Wiltshire, which was confined comparatively within a very narrow compass. This disease is not limited to two or three cow-sheds, but we see it in many; and diseased cattle are constantly being sold at Smithfield. You say we should protect ourselves: no doubt of it. But tell us what plan we can adopt. Just look at the loss we may sustain by this plague. To-day I may be worth a thousand pounds, and to-morrow have nothing. One thousand pounds of stock is soon gone. You talk about keeping the matter secret. Why, I understand the Government have sent a circular round to everybody. A person told me to-day, "I'll take no more milk, and I won't eat any more meat." I said, "You may do that for two or three months, but not longer." I really do not know what secret is kept. The whole matter has gone about from place to place. You have spoken of separating diseased from the healthy animals, and taking separate sheds for them. That, of course, is possible, but only where a cowkeeper has got ground for the purpose. Personally I will give you every assistance I can for the prevention of this disease, but I am really fearful of its having gone too far already.

Professor GAMGEE—When I said the country was perfectly unprepared to deal with this disease, I had in mind the warnings which had been given on the subject. Two years ago I suggested a plan, but it was not carried out. I knew the evil was coming, and that it was useless closing the stable-door after the steed had been stolen; but vested interests were against me. What I wanted was, a market where foreign stock could be sold as soon as imported, near to the wharfs, and where the animals could be slaughtered; and there could be a system of quarantine if necessary. Inspectors might also be appointed to examine the animals on their arrival; and at last we must come to that. But I got very much abused for my proposal. Had my suggestion been adopted, we would have been prepared to act with great caution against this calamity; but we are not prepared now. With regard to the observation of the gentleman who has last spoken, I beg to say, that though I quite admit that it is possible for the disease to be communicated by the clothes of an inspector, we know, from the experience of medical men attending scarlet fever and typhus cases, that, fortunately for them, the probability of propagating the disorder is infinitesimally small. With regard to the Government, I do not think any assistance can be expected from them, unless the calamity attains such proportions as to justify them in putting their hands in the public purse. In this matter a good deal is to be attributed to the fault of the cowkeepers themselves. When the bill I have spoken of was before Parliament, the trade was against me. Mr Giblett, Mr Swan, and others, every one, in fact, was abusing me as hard as he could, and not a single cowkeeper was by my side. The persons who have been most alive to their interests are the cattle-dealers, who not unnaturally feel for their pockets. They said, "We shan't have these foreign markets and this inspection, because they will diminish our profits." You allowed these cattle-dealers to have their own way, and nothing was done.

Mr BERRY, a "homœopathic veterinary surgeon" of Northampton, said he had felt it his duty to come up from the country to hear what Professor Gamgee had to say upon the subject of this disease, believing he was desirous of doing a public good, and not merely of strengthening his professional position. Veterinary surgery was at a discount, and they had heard that evening that it was thoroughly powerless for the cure of disease by the use of medicines. Under these circumstances, why should not veterinary surgeons go to the sister profession, and ascertain what they had done in similar diseases in the case of man. He was himself a believer in homœopathy, and as an instance of its success he spoke of the efforts of Mr Lord, principal veterinary surgeon at Canterbury Cavalry Depot, in the application of that system to a disease in horses, which he said resembled the cattle plague.

Mr BOWRON, a Wiltshire farmer, bore testimony to the truth of what Professor Gamgee had said respecting the small-pox in Wiltshire. A serious disease broke out

there amongst the sheep, but every one, instead of concealing, told the truth, and by co-operation the farmers in that county were enabled to keep the disease within their own boundaries. The result was just as Professor Gamgee had stated, namely, that the plague was arrested. He was convinced that the only remedy for the disease that had recently broken out among cows was, that the cowkeepers of London should remain faithful to each other, and that there should be a common purse to help those who had suffered severe losses.

Dr Druitt, president of the Metropolitan Officers of Health, said that as medical officer of St George's, Hanover Square, he was brought largely in communication with persons engaged in this trade, and he could bear testimony to the excellent manner in which they came forward to improve the condition of their sheds, and to keep their cattle free from disease, precautions which probably were as much for the benefit of the public as for themselves. As one of the guardians of the public health, he affirmed that nothing affected that health so much as a deficiency of food. A deficiency in meat, milk, butter, and cheese, was sure, in time, to bring the labouring population into a low state of health. He hoped they would allow him, as a fragment of the public, to express his sympathy with the class who composed this meeting in respect of the difficulties under which they were labouring, and a desire to make himself thoroughly acquainted with the facts of the case, in order that he might give them every assistance and encouragement that he could. As a medical man, he begged to say that his profession looked less to the cure of these fevers in a human being, and much more to their prevention. It was very well to talk about there being a specific against scarlet and some other fevers, but when men had them they must run the gauntlet of them. The resolution which he wished to propose was to this effect, "That this meeting considers it absolutely necessary that the proprietors of cattle throughout the country should combine together for their mutual protection, and that a society be formed entitled, 'The National Association for the Prevention of Cattle Diseases.'" He thought that this resolution was founded on common sense, and he hoped it would be carried. Their great object should be to prevent their cattle coming in contact with those which were diseased. They were very much in the condition of a man who kept a boarding-school. Sad experience taught him that when once a child suffering from some contagious disorder entered a school, many of his schoolfellows caught it. He had a son who was a cadet on board the training-ship *Britannia*, to which a boy happened to come suffering from scarlet fever, but so slightly as to be hardly recognised. The result was, that his son and scores of cadets caught the complaint, and suffered in the hospitals. If that scarlet fever had not been imported into the ship, all that amount of illness would have been avoided. Remedies were good in their way, but the common sense of the world had shown the best way was to prevent disease. With regard to the question of compensation, he thought that if they began by helping themselves, there was no class more likely to gain the support of the Legislature and the public at large than they were.

Mr J. Irons, of Winkfield Park, Windsor, a dairy farmer, in seconding the resolution, mentioned cases in his neighbourhood in which one dairyman had lost five, and a poor woman, three cows, and said that as the disorder was rapidly spreading, it was necessary that something should be done immediately. He especially alluded to the danger attendant upon the sending down cattle from London for sale at the auctions for cattle in the provinces.

A Cowkeeper said he happened to be very short of milk, and if he wanted one or two more cows where was he to get them? Was he to run the risk of going to Smithfield Market? And if he bought any there, was he to mix them with his own cattle? He could not put them anywhere else except with his own stock, and if he did accommodate them elsewhere, he would be summoned by the Government for keeping a cow-shed without a licence.

Mr Burge, the Medical Officer of Health for the Fulham district, said, that as a public officer his sympathy was with the meeting, and he rose to support the resolution, which he hoped would be unanimously carried. There was, however, one point of great importance which he thought had been somewhat overlooked—namely, offering some suggestion for the immediate guidance of cowkeepers. The association proposed could not be completely organised in a day, nor perhaps in a week, nor a month, and what he should like Professor Gamgee to do that night was to lay down a few simple rules for their guidance at the present moment; such as regulations as to the diet of cows, the temperature of cow-sheds, &c. With regard to licences for cow-sheds, he knew that the magistrates of the Kensington district had appointed a

supplementary day for granting these licences; and he had no doubt, that on proper representations being made to the other metropolitan justices, they would not hesitate to adopt the same course in the present great emergency.

Professor GAMGEE—It is impossible for me to speak satisfactorily at a moment's notice upon some of the points to which my attention has been specially directed. It was only on Saturday morning I arrived from Edinburgh, to take charge of a veterinary college, which has now been established at the west of London; but if you form this association, I pledge my word that before the end of the week you will all have printed instructions as to what should be done under various circumstances.

The resolution was then carried.

The CHAIRMAN said he thought the way in which the resolution had been adopted by the meeting, would be an indication of the disposition on their part to help themselves.

Professor GAMGEE said that the college which he was about to open would be a large and influential one, and his colleagues, who were very clever fellows, were ready to work for them. It would be necessary to appoint a provisional committee, with power to add to their number, and he should like to know if any gentlemen in the body of the meeting were ready to act upon it. He proposed they should meet on the following day, and he promised to find a room for their meeting free of cost.

A person in the body of the meeting suggested that the Government should be at once applied to, to prevent cattle in a diseased state from leaving Smithfield Market.

A COWKEEPER said he thought nothing satisfactory could be done without the assistance of the Government.

A list of the names of the provisional committee having been read,

Professor GAMGEE said his professional services were entirely at the disposal of the meeting.

After some further discussion, the list of the provisional committee was agreed to.

Colonel GARDNER—I cannot permit the meeting to be dissolved without proposing a vote of thanks to Professor Gamgee for the interest he has taken in your cause. His name is well known in relation to this subject, and there is very little doubt that of all men in the country he will be the most useful in this emergency. Such is the opinion I have of Professor Gamgee, that I am one of fifty noblemen and gentlemen, resident in London, who have banded themselves together for the purpose of bringing him and his very able staff from Edinburgh to the metropolis. In a few weeks time we shall have opened, in temporary premises in Queen's Road, Bayswater, the Albert Veterinary College, over which he is to preside. Professor Gamgee is an Englishman, and not a Scotchman, and he is much better here than in Edinburgh. As one of the vice-presidents of this college, I answer for it that it will do everything in its power to try and eradicate or stop the progress of this malady. The offices of the company at 48 Pall Mall are entirely at your service.

Some one in the body of the hall suggested that some means should be adopted of meeting the expenditure which the movers in this matter had defrayed out of their own pockets.

The resolution was then carried unanimously.

Professor GAMGEE, in returning thanks, again promised in every possible way to help them in their present difficulties. The credit of calling this meeting really belonged to the chairman, Mr Dexter, who was an honour to any calling, and a good representative of the metropolitan cowkeepers. He had that warm-heartedness and that intelligence which could not but be felt and admired by all with whom he came in contact. He had great pleasure in moving a vote of thanks to Mr Dexter, for the able manner in which he had presided over the meeting. There was no doubt that a great deal could be done to mitigate the evil, but they could do nothing without the sinews of war. They must have funds, and it was proposed for that purpose that every member of the association should begin by depositing a guinea. They must have an appeal to the country, and stand by and relieve those cowkeepers who were suffering. He had no doubt they would all agree to award a vote of thanks to their chairman.

The motion having been seconded, was passed *nem. con.*

The CHAIRMAN, in acknowledging the compliment, said it was intended to have a meeting in the same hall that night week, and he hoped that it would be crowded.

The proceedings then terminated.

THE CATTLE PLAGUE.

[For the following article we are indebted to George Armitage, Esq., Secretary to the National Association for the Prevention of Cattle Diseases, London.]

EXACTLY one hundred and eighteen years ago the cattle of this country were destroyed by disease of a highly contagious character, admitting of no relief from medical treatment, and resisting all efforts to arrest its progress until the losses amounted to near 30,000 per month, representing in money value many millions sterling. At the present time we are in a similar position, and, doubtless, ere the plague is stayed, the losses, direct and indirect, will not fall far short of what has actually occurred in the time above named. That such will inevitably occur, is a reasonable inference to be drawn from a review of the state of affairs in connexion with our importation of foreign stock and loose method of admitting cattle of all kinds to intermix in our fairs and markets throughout the kingdom. Some individuals—doubtless with greater zeal for establishing strongly cherished opinions, than for testing the security of their foundation—hurl bitter invectives against the public for allowing such a state of things to exist, when in reality, not only are the public not supposed to think seriously upon such a matter, by reason of their total ignorance of the proceedings, but are exonerated from such condemnation by reason of their having allowed the supervision of such matters to others—those who are supposed to be thoroughly acquainted with all the details, and understood to be able to carry them out to the advantage of the community at large. Faulty management in most instances is the forerunner of mischief, and what is more—such increases in direct ratio with the magnitude of the undertaking, results are brought about involving absolute loss of the most serious description, for which a remedy is propounded as incapable as it is irregular. As the old proverb says, "'Tis useless to lock the stable, when the steed is stolen;" in this instance a remedy is offered at a period too late to effect any impulse against the scourge of a direct character. While this unsystematic course of importation of diseased cattle is allowed to proceed, we may expect to remain in continual dread of the outbreak of such diseases as contagious typhus or Russian cattle plague—known also as rinderpest—steppe—murrain—and *losedure* of the Germans. In the introduction of foreign stock to our markets, particularly when animals are selected from countries well known to generate these pestilential disorders, we can scarcely be too stringent; and based upon a thorough knowledge of their origin, nature, period of incubation, &c., &c., a certain number of days under quarantine should be strictly enforced, in order to insure that all diseased animals shall be unmistakeably found and removed from the healthy ones; and those having survived the period prescribed, allowed to proceed to markets only to be used for foreign stock. Diseased animals should be destroyed, and immediately buried at considerable depth—quick lime being thickly spread over their bodies, and afterwards closely covered with soil; and those apparently healthy, taken from a number in which others have become affected—slaughtered whilst their flesh is not unfit for human food. Hides, hoofs, horns, hair, &c., taken from diseased animals, should be carefully disinfected before removal. Next to this comes a careful inspection of all animals; but for this purpose, hitherto men of all classes have been chosen without due regard to their knowledge of animals and their diseases. It is thus that first symptoms are overlooked or unrecognised. In the hands of unprincipled salesmen, who reap a harvest at such times, disease is spread abroad; and God only knows the end. During the past week great numbers of animals have died, and through the efforts of the National Association for the Prevention of Cattle Disease, much information as to the details of the disease and its ravages have been obtained, which has led to many valuable suggestions being carried out as a means of arresting its progress after its appearance among stock. The principle of early segregation has produced very beneficial results; and Dutch cattle known to be diseased disposed of in this manner have sickened and died, whilst the original stock have remained unaffected. In the present national calamity, cattle-owners should promptly assist in a means of mutual protection. The inconveniences, although heavily felt by them, are in nowise of less consequence to the public, as far as the supply of unwholesome meat and milk is concerned, and while thus keenly felt, they would do well to co-operate with cattle-owners in order to effect, not only for the present, but also prospectively, a preventative of the occurrence of such a scourge as the present. Local Insurance Societies cannot cope with such; it is only on the principle of national co-operation that the extensive machinery required to meet the emergency

can be put in motion. Circulars, &c., and all information relating to the treatment of animals are now being freely distributed by the association, and persons interested should lose no time in communicating all information of the outbreak of the disease with a view of receiving assistance in its suppression.

THE CATTLE DISEASE.—Professor Gamgee made some startling statements at the Marylebone Institute one evening last week. A meeting of London cowkeepers was there held, and the Professor addressed them with respect to a disease which has broken out in the cow-houses of London. In many cases the whole of the stock have been carried off; in others most of the animals have died, or have had to be killed to prevent the disease spreading. Professor Gamgee says it is the Russian cattle plague, and adds that the infection has no doubt been brought to this country by some foreign cattle. He declares there has not been a market held at Islington during the month of July at which diseased cattle have not been sold. He does not believe the disease affects human beings. To prevent the recurrence of similar plagues he counsels the formation of a Cattle Disease Prevention Society, which shall set along with the Government in dealing with all such matters, and he strongly advises that there should be a special market for the sale of foreign cattle. His advice as to the formation of a society was at once taken.

THE FRENCH HORSES.

To the Editor of the Sportsman.

SIR,—Will you allow me to offer a few remarks on a subject that has been pretty well ventilated and rather freely commented on by your more ancient contemporaries, and grant me permission to explain how it is that the French horses are improving and ours retrograding. A great deal has been written and remarks made not at all complimentary to Count de Lagrange—remarks, in my opinion, both unjust, ungracious, and uncalled-for. The special commissioner of one paper designates the French two-year-olds as old ones, forgetting, when he does so, that he brands that most respectable and talented body, the veterinarians of England, a set of stupid dolts, for they must be both stupid and ignorant if they cannot distinguish a two from a three-year-old. I will endeavour, with your permission, to explain how it is that the Count's horses display higher form as two-year-olds than ours. In the first place, the Count is a shrewd man, a capital judge, and no niggard; secondly, he breeds not for *sale*, but to *race* his young stock, which are not reared like hothouse plants, but allowed to roam about until September or October; they are not taken up, as many of ours are, the previous December from their natural element, with the view of early sale in the spring, as fat and as sleek as oil-cake and barley-meal can make them—such food, in my opinion, being totally unsuited to the equine race. The French two-year-olds don't appear on our racecourses with feet like mules or donkeys, and shins like pipe-stoppers, caused by their standing on the hot dung, instead of what nature intended for them. When the proper time arrives they are ready to go into work, and Jennings has only one task to perform—viz., get them fit; whereas the majority of our trainers have first to get rid of the superabundant fat produced by the oil-cake and barley-meal, and to replace it with good sound flesh, which the Count's possess when they arrive at their training quarters. I ask John Scott, a Dawson, or a Day, is there anything they dislike more than a *fat* or *forced* yearling? I also ask the same competent authorities whether a foal or a yearling is not much more likely to engender bone and muscle roaming about on the rich plains of Normandy than shut up in a confined box, perpetually inhaling the same atmosphere, with a view of appearing before the auctioneer early in the spring with a sleek coat, and producing a large average? I assert, without fear of contradiction, that nine-tenths of the horses that become roarers become so from this early-produced fat, or, more properly speaking, blubber. As a proof of it, there is not one roarer in France to every fifty in England. Again, the French young ones are not asked to race before they scarcely know how to canter, to test their merits at the expense of their poor feet and constitution, so as to find out if they are worth engaging; this, in my opinion, is being penny wise and pound foolish. Let English breeders give my plan a trial, eschew oil-cake, barley-meal, and such like trash, and if we are not placed in our original position, able to contend against all nations, I am prepared to forfeit more than it is at present convenient to pay; but as security I will effect a mortgage on my Irish estate, which is in the parish of *Moonish* county, of Bunninadden province, of Connaught, Ireland.—I am, Sir, your *obedient* servant,

AN ENGLISHMAN IN PARIS.

ON THE TOOT PLANT AND POISON OF NEW ZEALAND.

(*Continued from page* 446.)

II.—C. thymifolia, Humb.—The majority of specimens have lanceolate, acuminate leaves; both plant, leaves, and racemes being smaller than in the preceding. Some of Colenso's specimens from the North Island of New Zealand (no precise locality given on the labels) are intermediate in size of plant and leaf between C. ruscifolia and C. thymifolia. Mount Egmont, Dieffenbach: a very small plant, with very small linear-lanceolate leaves, characteristically named, resembling our Thymus serpyllum in general aspect, though it is usually somewhat taller. This and other forms of C. thymifolia are probably referrible to the C. angustissima, Hook. fil. of Dr Hooker's "Handbook." Milford Sound, Lyall: a tallish plant, with linear-lanceolate leaves and largish berries on a sparse raceme. Nelson, Bidwill; variously labelled vars. of C. sarmentosa or C. thymifolia: intermediate between the C. ruscifolia and C. thymifolia types. Sub nom. C. lanceolata: Colenso: seems more referrible to C. ruscifolia, and is an intermediate form between it and C. thymifolia; pedicels vary in length, occasionally as long as the bracts, sometimes longer. Mount Hikurangi, Colenso, 1844: a thyme-like shrub as to size of plant and leaves, (C. angustissima, Hooker's "Handbook.") Tongariro, Bidwill: a larger plant; leaves sparse and larger; racemes sparingly covered.

Central American specimens; Mexico, Hartweg: whole plant, and especially in size and form of leaf, approaches C. ruscifolia: a somewhat lax shrub, with largish leaves. Different parts of Mexico, Galeotti and Linden: sometimes with densely-covered, smallish racemes. Generally speaking, the Central American specimens of C. thymifolia have leaves much more resembling those of Ruscus aculeatus than C. ruscifolia itself. New Granada, Pichincho, 12,000 feet, Hall: a dense shrub, with ovate or ovate-lanceolate leaves, and small, densely-covered racemes. Andes of Ecuador, Spruce, 1857–9: a shrub of similar character, save that the leaves are more acuminate and lanceolate. Peru, near Huanaco, Matthews: sub nom. var. microphylla of C. ruscifolia. Several other Peruvian specimens are labelled C. phylicifolia, and are all apparently referrible to C. thymifolia. New Granada, province of Rio Hache, Sierra Nevada, 10,000 feet, L. Schlimm's voyage: No. 808, "Flora Neo-Granadina," Bogotina, I. F. Holton, Oct. 1852: leaves more lanceolate and acuminate, and racemes sparser than usual. Caraccas, J. Linden, April 1842; Quito, Jameson; Colombia, Linden.—(Hooker. Herb.)

New Zealand, Dr Hooker, 1842: intermediate as to size and shape of leaf between C. ruscifolia and C. thymifolia. Sub nom. C. myrifolia: more shrubby and Privet-like. Quito, Spruce, Aug. 1837: branchlets densely covered with small ovate-lanceolate, acuminate leaves: racemes also closely covered. Santa Martha, Purdie: leaves vary greatly in shape in same plant, (as is frequently the case with the species of Coriaria:) generally small, ovate, oblong-ovate, or lanceolate, and mucronate.—(Bentham. Herb.)

Sub nom. C. microphylla, Peru, Matthews: in fruit: in no respect differs from C. thymifolia: ten feet high near Huanaco. Ecuador Andes, Spruce; quite the Peruvian plant.—(Edin. Herb.)

III. C. Nepalensis. Wall.—In general has a close resemblance to the Otago C. ruscifolia. Sikkim, alt. 5000 to 7000 feet: Dr Hooker. Herbar. Indic., Hooker and Thomson; also Lachen, alt. 10,000 to 11,000 feet; and Samdong, alt. 11,500 feet, July 1849; Chongtam, alt. 8000 feet, May 1849. Kumaon, (Nynee Tal,) April, 1844, Thomson: more shrubby and fibrous than usual. Kapkot, Kumaon, alt. 3500 feet: Himalayan Herb. of R. Strachey and J. E. Winterbottom. Bootan, Griffith: North-western Himalaya, alt. 3000 to 6000 feet: Thomson. N. W. India, Royle. Dhara Dhoon: Jacquemont's "Voyage to the East Indies:" intermediate between Privet-like forms and Otago large-leaved forms of C. ruscifolia: shrubby.—(Hooker. Herb.)

Kumaon, Wallich, 1832. Himalaya; alt. 5000 to 8000 feet; M. P. Edgeworth, 1844: have the aspect of South American forms of C. ruscifolia.—(Bentham. Herb.)

Kumaon: resembles C. myrtifolia, save as to size of leaf, which is here larger.—(Edin. Herb.)

IV. C. Japonica, Asa Gray. Japan: Herbarium of the U.S. North Pacific Exploring Expedition under Commanders Ringgold and Rodgers, 1853–6: bears a close resemblance to the New Zealand C. ruscifolia in the size of the plant, leaves, and berries; leaves more acuminate; racemes shorter.—(Hooker. Herb.)

V. C. myrtifolia, L. Spain: Boissier and Reuter, "Iter Algeriensi-Hispanicum," July 1849: somewhat resembles C. Japonica San Roque and Barcelona, Bourgeau's Spanish-Pyrenees Herbar., No. 487, April 1847: a woody, dwarf, Privet-like shrub. Requien in the Cevennes. Algeria, May 1837: also a Privet-like shrub, but larger than the Pyrenees specimens.—(Hooker. Herb.)

Perpignan: leaf lanceolate, resembling that of senna: more rigid than that of the New Zealand Coriariæ. Montpelier, All these French specimens seem distinct from any of the New Zealand species of Coriaria.—(Edin. Herb.)

From the foregoing enumeration and comparison it would appear that—

1. *All* the species of Coriaria, wherever they occur, are more or less variable, especially as to the size of the plant, leaf, raceme, and berry: the leaf varying in shape frequently on the same plant.

2. The three New Zealand species (if these really are separate species) are pre-eminent above others, save perhaps those of South America, in their variability.

3. Several *Book-species* are probably only synonyms, or represent forms or varieties of other species. Such are C. sarmentosa, C. lanceolata, C. microphylla, C. Cunninghamii, C. myrifolia, C. phylicifolia; and such also, I am inclined to think, are the C. thymifolia and C. angustissima of Dr Hooker's "Handbook;" both of which, with all their intermediate forms, I would refer to C. ruscifolia.

4. Probably some of the more typical species, representative of remotely separated countries—such as the C. Nepalensis of the Himalayas and C. Japonica of Japan—may yet prove identical with, or at least forms of, the older and better known species, such as C. ruscifolia or C. myrtifolia.

5. C. ruscifolia, as at present defined, appears limited to New Zealand and South Chili; but C. thymifolia has a much wider geographical range, occurring throughout New Zealand as well as in America, from Mexico to Peru—ascending the equatorial Andes to 12,000 feet.

6. The species or forms designated in Dr Hooker's "Handbook" C. ruscifolia, C. thymifolia, and C. angustissima, pass into each other by gradations equally in South America and New Zealand.

7. Not only does the genus, as developed in New Zealand, deserve and demand the attention of the local botanist; but the whole genus, wherever its species are distributed, would repay a critical examination, and should become the subject of a short exhaustive monograph at the hands of some competent authority, who has the necessary access, for comparison, to large suites of specimens from all parts of the world, and from every variety of habitat.

The following are the more prominent or main botanical characters of—

1. C. ruscifolia: a perennial shrub, generally a few feet high, sometimes attaining 10–20 feet, or upwards, and even assuming the form and dimensions of a small tree 6–8 inches in diameter; generally forming with fern, flax, and other plants, "scrub', on open ground; sometimes, also, growing in the "bush," (forest.) Branches angular; leaves generally opposite, entire, 1–3 inches long, sub-ovate, acuminate, subsessile. Flower-racemes 8–12 inches long, drooping, many-flowered, pubescent, axillary. Flowers very minute, green, and inconspicuous. Petals become, when the fruit is ripe, succulent and full of purple juice,* constituting what is generally called by settlers the berry. Fruit consists of 5–8 small, oblong achenes, or carpels, enclosed in the short, triangular, fleshy petals.

Dr Hooker, in his "Handbook of the New Zealand Flora," recently issued, enumerates other two New Zealand species of Coriaria, both of them smallar than C. ruscifolia, and less liable to be eaten in any of their parts—and especially their seeds or berries—by man or animals. Both, apparently, are annuals; while the larger C. ruscifolia is, as already stated, a perennial.

2. C. thymifolia, Humb., has more lanceolate leaves, ¼–1 inch long; it is generally more pubescent than C. ruscifolia; is sometimes only about a foot high, and has shorter racemes and smaller flowers. It grows in dry places, and ascends to 5000 feet.

3. C. angustissima, Hook. fil, new species, is a small, bright, green annual, 6–18 inches high, with the habit of the preceding species, save that the branches are glabrous, very slender, and denser, and the leaves very narrow, linear-lanceolate, about ¼ inch long. It appears mostly to affect subalpine localities.

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*The juice of the stem and branches is colourless; but it uniformly produced on my fingers—after a little exposure to the air—a deep purple stain, resembling that of our blaeberry.

My conviction is strong that the two latter are mere forms of the first species, the differences in the size of all parts of the plant being produced by the differences in habitat; the smallest forms, as a general rule, occurring at the greatest elevations and in the most exposed, driest localities.

§ 3. Seat of the Poisonous Principle.

To cattle and sheep the poisonous part of the plant is usually the young shoot: this, in spring, is tender and succulent, and resembles otherwise the shoots of Asparagus.

My friend, Mr Manning, holds opinions—as to the parts of the plants which are poisonous—so far exceptional or peculiar, that I prefer giving them in his own words, only premising that his remarks apply to the northern districts of the North Island—some 800 or 1000 miles distant from Otago :—

"The poison is supposed commonly, by Europeans, to exist in the seeds: but the natives say it is not in the seeds, but in a very fine fur * or hairy, reddish excrescence, which grows on the stalk close to where the berry adheres to it; and that it is this which, when taken into the stomach, has the poisonous effect. This fur, or down is so fine as to be scarcely visible to the naked eye; and I am inclined to think the natives are right in their assertion, for many kinds of birds live entirely on the Tutu berries when in season; and I can assure you, swallow the seeds with great voracity. The 'Tui,' or Blackbird, (Prosthemadera Novæ Zelandiæ,) I have kept tame and fed for months on nothing else. The bird, I observed, picked the berries off the stalk one by one and swallowed them whole, or at least seed and all, leaving the stalk—to which the supposed poisonous fur adheres—behind. This stalk is a small lateral stalk from the main one to which the berry adheres." It does not at all follow, however, that because birds are unaffected, the seeds are innocuous. The illustrations cited in pp. 169, 170, 171, and 175, of substances which, while innocuous to certain animals, become deadly poisons to certain others, sufficiently show the fallacy of any such line of argument.

To the human subject, the seed is usually the *corpus delicti;* though, as in the case of the inquest at Dunedin already referred to, the young shoot or the leaves are occasionally a cause of poisoning or death in children and adults. The seeds are contained in a beautiful dark purple, or blackish, berry, (in reality consisting of fleshy, enlarged petals,) resembling somewhat the blackberry—which grows in clusters, (racemes,) resembling those of our black currant. It is a very tempting fruit, the succulent portion whereof yields a juice,† and the latter, on fermentation, a wine‡ resembling elderberry wine, which are great favourites equally with Maoris and settlers, and which are, in ordinary quantities at least, quite harmless.

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* Alluding probably to the pubescence of the raceme which is least in C. ruscifolia, and greatest in C. thymifolia.

† The juice of the berry (fleshy petals) of a closely allied species, if it is not in reality a mere variety of C. ruscifolia, (viz., C. thymifolia,) is, under the name of "Chauci" used as *ink* in New Granada, where the plant is hence known as the "Ink plant." It is employed without admixture, its colour being at first red, but becoming in a few hours black. It has this advantage over ordinary ink, that it does not corrode steel pens.

‡ Dr Seemann says that the Maoris apply the term "Kawa" to a beverage made from the fruit of Coriaria myrtifolia, Linn.: their "Tūpa-kihi," "Tūtu," or "Pūhou." In this statement, however, he has apparently committed several important errors. C. myrtifolia does not occur in New Zealand at all, unless, indeed, botanists should hereafter agree to conjoin it with C. ruscifolia as one species. The latter is the true "Tūtu" of the Maori. Though he makes a wine therefrom, there is no evidence it is called "Kawa." This term, or rather the term "Kāwakāwa," is applied in New Zealand only to Piper excelsum, Forst., (N. O. Piperaceæ,) which is allied to the "Kava" or "Kawa" proper of the South Sea Islands, (Macropiper methysticum: the term "Kava" properly referring to its thick rhizome.) Dr Thomson also falls into some confusion on the subject of "Kava," in so far as he states that the "Kava" plant (Macropiper methysticum) grows abundantly in New Zealand, and that the Maoris have "forgotten the art of extracting [by chewing] an intoxicating beverage" (a narcotic) from its root: a practice which he says is common among Polynesians in more tropical islands. He appears to have mistaken the common North Island P. excelsum for the Polynesian "Kava" proper. Dieffenbach, who writes sixteen years prior to Thomson, and nineteen prior to Seemann, puts the matter much more correctly when he speaks of the New Zealand P. excelsum as the New Zealand "Representative of the Piper methysticum of the Sandwich and Tonga Islands." "Although bearing the same name," he says, "it is not used by the New Zealanders to make an intoxicating drink; its leaves, however, form a good and apparently healthy substitute for tea."

Dr Hooker of Kew, the highest authority on the New Zealand Flora, writes me (January 31, 1865) in reference to this subject: "The Kava Pepper is certainly, as you suppose, the Macropiper methysticum. It does not occur in New Zealand, though very near the P. excelsum, which is also a micropiper according to Miguel, the founder of the genus. My own idea, and that of most botanists, is that Piper should be kept entire as a most natural genus; but I would not speak positively without going into the whole order."

Mr Manning makes a qualified statement when he says, "The juice of the Tutu berry is not poisonous, and when pressed from the berry is a favourite drink with both natives and Europeans who have got accustomed to it. In Otago the settlers are in the habit of squeezing the ripe berries in a pocket-handkerchief, and sipping the juice, which exudes, with impunity. Dr Thomson states that, prior to the colonisation of New Zealand, the natives used the juice of the Tutu berries to sweeten water; converting it, I presume, into an equivalent to the French *eau sucrée*, or our lemonade; while they also sweetened and coloured with it the jelly of certain seaweeds, after the manner of our *blanc mange et hoc genus omne*.

§ 4. Its Nature.

It is probable that the same active poisonous principle, recently detected in C. myrtifolia by M. Ribau, and named by him Coria myrtine, may also be the active poison of the New Zealand "Toot." This, however, has yet to be determined. The experimental effects of this substance resemble closely the poisonous effects on men and animals, on the one hand, of C. myrtifolia, and on the other of C. Ruscifolia. In M. Ribau's hands, the symptoms of poisoning by Coriamyrtine in dogs and rabbits were, violent movements of the head, communicated to all the limbs; clonic and tetanic convulsions, returning by fits; contraction of the pupils, trismus, foaming at the mouth, and at last asphyxia. The principal *post-mortem* appearances were brownish coagulated blood in the heart-cavities, pulmonary artery, and inferior vena cava; brown spots on the lungs; and hyperamia of the cerebral membranes. The intestinal mucous membrane and muscular contractility, however, appeared *un*affected.

§ 5. Its Physiological Action.

A. *On Man.*—In action the Toot plant or poison is, like its congener, C. myrtifolia, apparently referable to that section of Narcotico-irritants, or Narcotico-acrids, whose action is exhibited mainly on the brain and spinal cord; or using the terms of another and newer, and more philosophical, classification of poisons, to the Cerebro-spinal section of Neurotic poisons. The term narcotico-irritant is not strictly correct or applicable, in so far as there are rarely, if ever, symptoms of irritant action; the poison apparently being a pure Neurotic, affecting primarily and chiefly the brain, and secondarily the spinal cord.

In man the symptoms of Toot-poisoning may be shortly stated as, generally, giddiness, stupor, coma, with or without delirium or convulsions; but the details differ in different individuals. Sometimes there are symptoms like those of brain fever; occasionally the delirium resembles that of alcoholic intoxication, or delirium tremens; at other times it rather approximates that of acute mania, being marked by great muscular excitement, the patient requiring restraint of the most powerful kind—in some instances, the assistance of several strong men for several hours. One of the characteristics of the convalescent stage is loss of memory, with or without a vertiginous condition.

I append, as illustrations, reports from the Otago newspapers of one or two fatal accidents to adults or children from eating various parts of the Toot plant:—

"We regret to announce the death of a child, . . . which is reported to have been caused by his eating the young leaves of a small shrub called 'Toot,' or 'Tutu.' His sister, about seven years of age, was attacked the same day, and for a considerable time was dangerously ill. Two medical men were in attendance, but too late to preserve life in the younger child. The shrub, which has apparently been the cause of death, is fatal not only to man, but to cattle and sheep, being more deadly at some periods than at others. We have often heard of the injurious effects from children and grown-up men eating the ripe berries, but do not remember a similar instance to the present. . . . We would caution parents not to allow their children to stray where this shrub is prevalent, especially in the low and shady glens, where it appears most deadly in its effects."—*Otago Witness*, Oct. 12, 1861.

"A fine young man, on his way to the diggings, has just met his death from partaking of the Tutu plant. He was camping near Wetherstone's, when he took some grass in his mouth and ate some of the poisonous plant or berry. He soon complained of illness; a doctor was sent for, and he was without loss of time conveyed to the hospital, where he died next day. . . . . He had just arrived from Sydney. The jury appended a rider to their verdict, recommending the Government to publish prominent notices in the newspapers of the description of the Tutu, together with a warning to new arrivals not to partake of it. Tutu is a small bush, with a berry like the elder. The Maoris express an agreeable juice from the berry, but carefully avoid

the seed, which, with the leaves and shoots, produce a narcotic effect, frequently proving fatal to both men and cattle."—*Otago Daily Times*, Nov. 15, 1862.

The same case, apparently, is also thus referred to in the "Tuapeka [Gold Field] Hospital Report," (November 16, 1862.) "A somewhat strange case of poisoning from eating the leaves of the Tutu plant was admitted into the hospital last week. From what I can learn, the person poisoned was a new arrival, unacquainted with the dangerous properties of the Tutu plant; and that, while waiting for his mates to bring provisions from Wetherstone's, he had eaten a few of the leaves. Shortly afterwards he was seized with severe pains in the bowels, and as he appeared to be getting worse, was removed to the hospital, where he lingered until the following morning. An inquest was afterwards held on the body . . . . and a verdict returned, 'That the deceased had died from eating the leaves of the poisonous Tutu plant.'"—*Otago Daily Times*, Nov. 18, 1862.

Mr Manning remarks, "The sickness occasioned by swallowing the Tutu berry—as I think, with the small stalk adhering, which has the poisonous fur—is just to all appearance the same as an attack of epilepsy. If a certain quantity is taken into the stomach, certain death will follow. Some French sailors, several years ago, poisoned themselves [about twelve men] by eating the Tutu berry. A quick recourse to the stomach-pump saved most of them; but about four, I think, died."

The following cases will suffice to illustrate the poisonous, but non-fatal effects of eating the tempting and luscious berries, including the seeds, on man:—

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Mr Manning makes a qualified statement when he says, "The juice of the Tutu berry is not poisonous, and when pressed from the berry is a favourite drink with both natives and Europeans who have got accustomed to it. In Otago the settlers are in the habit of squeezing the ripe berries in a pocket-handkerchief, and sipping the juice, which exudes, with impunity. Dr Thomson states that, prior to the colonisation of New Zealand, the natives used the juice of the Tutu berries to sweeten water; converting it, I presume, into an equivalent to the French *eau sucrée*, or our lemonade; while they also sweetened and coloured with it the jelly of certain sea-weeds, after the manner of our *blanc mange et hoc genus omne.*

§ 4. Its Nature.

It is probable that the same active poisonous principle, recently detected in C. myrtifolia by M. Ribau, and named by him Coria myrtine, may also be the active poison of the New Zealand "Toot." This, however, has yet to be determined. The experimental effects of this substance resemble closely the poisonous effects on men and animals, on the one hand, of C. myrtifolia, and on the other of C. Ruscifolia. In M. Ribau's hands, the symptoms of poisoning by Coriamyrtine in dogs and rabbits were, violent movements of the head, communicated to all the limbs; clonic and tetanic convulsions, returning by fits; contraction of the pupils, trismus, foaming at the mouth, and at last asphyxia. The principal *post-mortem* appearances were brownish coagulated blood in the heart-cavities, pulmonary artery, and inferior vena cava; brown spots on the lungs; and hyperamia of the cerebral membranes. The intestinal mucous membrane and muscular contractility, however, appeared unaffected.

§ 5. Its Physiological Action.

A. *On Man.*—In action the Toot plant or poison is, like its congener, C. myrtifolia, apparently referable to that section of Narcotico-irritants, or Narcotico-acrids, whose action is exhibited mainly on the brain and spinal cord; or using the terms of another and newer, and more philosophical, classification of poisons, to the Cerebro-spinal section of Neurotic poisons. The term narcotico-irritant is not strictly correct or applicable, in so far as there are rarely, if ever, symptoms of irritant action; the poison apparently being a pure Neurotic, affecting primarily and chiefly the brain, and secondarily the spinal cord.

In man the symptoms of Toot-poisoning may be shortly stated as, generally, giddiness, stupor, coma, with or without delirium or convulsions; but the details differ in different individuals. Sometimes there are symptoms like those of brain fever; occasionally the delirium resembles that of alcoholic intoxication, or delirium tremens; at other times it rather approximates that of acute mania, being marked by great muscular excitement, the patient requiring restraint of the most powerful kind—in some instances, the assistance of several strong men for several hours. One of the characteristics of the convalescent stage is loss of memory, with or without a vertiginous condition.

I append, as illustrations, reports from the Otago newspapers of one or two fatal accidents to adults or children from eating various parts of the Toot plant:—

"We regret to announce the death of a child, . . . which is reported to have been caused by his eating the young leaves of a small shrub called 'Toot,' or 'Tutu.' His sister, about seven years of age, was attacked the same day, and for a considerable time was dangerously ill. Two medical men were in attendance, but too late to preserve life in the younger child. The shrub, which has apparently been the cause of death, is fatal not only to man, but to cattle and sheep, being more deadly at some periods than at others. We have often heard of the injurious effects from children and grown-up men eating the ripe berries, but do not remember a similar instance to the present. . . . We would caution parents not to allow their children to stray where this shrub is prevalent, especially in the low and shady glens, where it appears most deadly in its effects."—*Otago Witness*, Oct. 12, 1861.

"A fine young man, on his way to the diggings, has just met his death from partaking of the Tutu plant. He was camping near Wetherstone's, when he took some grass in his mouth and ate some of the poisonous plant or berry. He soon complained of illness; a doctor was sent for, and he was without loss of time conveyed to the hospital, where he died next day. . . . . He had just arrived from Sydney. The jury appended a rider to their verdict, recommending the Government to publish prominent notices in the newspapers of the description of the Tutu, together with a warning to new arrivals not to partake of it. Tutu is a small bush, with a berry like the elder. The Maoris express an agreeable juice from the berry, but carefully avoid

the seed, which, with the leaves and shoots, produce a narcotic effect, frequently proving fatal to both men and cattle."—*Otago Daily Times*, Nov. 15, 1862.

The same case, apparently, is also thus referred to in the "Tuapeka [Gold Field] Hospital Report," (November 16, 1862.) "A somewhat strange case of poisoning from eating the leaves of the Tutu plant was admitted into the hospital last week. From what I can learn, the person poisoned was a new arrival, unacquainted with the dangerous properties of the Tutu plant; and that, while waiting for his mates to bring provisions from Wetherstone's, he had eaten a few of the leaves. Shortly afterwards he was seized with severe pains in the bowels, and as he appeared to be getting worse, was removed to the hospital, where he lingered until the following morning. An inquest was afterwards held on the body . . . . and a verdict returned, 'That the deceased had died from eating the leaves of the poisonous Tutu plant.'"—*Otago Daily Times*, Nov. 18, 1862.

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The original Otago settlers, before they had acquired sufficient experience to entitle them to be considered competent judges, evidently took Mr Manning's view as to the cause of the death of animals from Toot. I find, for instance, one of the first "Pilgrim Fathers" of the Church in Otago, the venerable Rev. Dr Burns of Dunedin, thus writing from Port Chalmers on the 19th of April, 1848, the year in which Otago was first colonised: "The Toot plant," he says, "is greedily fed on and with safety by cattle acclimated; but on cattle newly arrived, and especially off a sea voyage, it acts as wet clover does in England, the animal swells and dies." It may happen, in some cases at least, that simple gastric distension—mere over-feeding with food which swells rapidly—is, though not *the* cause, *a* cause of death, assisting the operation of the Toot-poison—the coriamyrtine—or other essential alkaloid. At all events, before disposing of, or setting aside as inoperative, such a phenomenon as causative of death, we must remember that simple distension of the stomach is not an uncommon cause of sudden death both in man and animals.

From the evidence of Mr Manning of Hokianga, it would appear that Toot-poisoning of cattle, sheep, horses, and other animals, in certain parts of the North Island, is, if not unknown, at least very rare.

"Horses," says he, "eat of the Tutu berry wholesale—stalks and all—with impunity. I have seen them devouring the Tutu with the greatest avidity, and I have never known an instance of a horse being injured.

"I do not know an instance of any horned cattle eating the Tutu berries. Though I have hundreds of times seen cattle in the Tutu scrub, when the berries were ripe, I never saw them eating the berries; and, if they do, I feel sure they are not injured by them. No cattle are ever found dead here, or very seldom, at the time the Tutu berries are on the tree; or, if so, the death can be accounted for in another way than as arising from the berries.

"Cattle are, however, sometimes killed in whole herds by eating the Tutu, but not the berries. As the berries are known to have a poisonous effect on the human subject, this has, I think, caused the idea that cattle are also killed by the berries. This is, I believe, a misapprehension to be explained as follows: The Tutu bush grows in general in the midst of thick fern, (Pteris aquilina, L. var. esculenta, Forst.) This fern grows from four to seven feet high in many places, and every third or fourth year becomes dry, and either catches fire accidentally, or is set fire to, to clear it off. When this occurs, the Tutu bushes are burnt off also level with the ground. This happens generally in the summer or autumn. During the next spring the root throws up great numbers of green, sappy, succulent shoots, which grow with surprising rapidity, and exactly resemble gigantic asparagus, as thick as a man's arm, and six feet long, before they begin to have the consistency of wood. These shoots are of a very bright green colour, and are so watery inside as to have barely sufficient consistency to stand upright. The least touch breaks them off like an icicle. Now, the cattle devour these shoots with the greatest greediness, and as almost a matter of course die. But these shoots are not, properly speaking, poisonous; in moderate quantities they do cattle no harm at all, but when the cattle are killed, which they are sometimes in whole herds, the symptoms are exactly the same as those arising in Australia from eating too much at once of the young spring grass, or in England from eating green clover. In fact, the cattle are, as we used to say in Tasmania, 'blown;' I don't know what they call it in England. The same remedies as used in Tasmania and England are equally efficacious here, though seldom used, people being very careless, and in general letting the cattle live or die, as the case may turn out.

"I have never known either sheep or pigs to receive any harm from the Tutu berries, or from any part of the plant. Nor, indeed, have I ever observed that sheep or pigs feed on it, though I have had a flock of sheep and great numbers of pigs running amongst groves of Tutu for twenty years. Certainly I have never lost a sheep or pig from this cause, and I know to a certainty that both sheep, pigs, and horses refuse to eat the green shoots, which the cattle are so fond of, and which are so fatal to them.

"To the best of my belief I have never heard an authentic instance of any of the inferior animals, large or small, having been injured by eating the Tutu berries, or even the berries with the supposed poisonous stalk having the fur I have mentioned; though it is no doubt quite likely that they might be poisoned if forced to eat them contrary to their natural instincts.

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ing in his house, about four o'clock one afternoon, partook of some Toot berries: the older gathering them from old Toot plants, the younger from younger plants. The younger, moreover, sucked the berries, but spat out the seeds; hence, probably, the reason that he was unaffected. The elder, however, about 9 P.M. was seized with convulsions, which speedily became so violent that it required two strong men to manage him. These convulsions were severe for about forty minutes, when they gradually diminished, and the patient passed into a state of stupor. He continued in this state all next day, and when convalescing therefrom, resembled a person emerging from a brain fever. He was utterly oblivious of the particulars of his illness, denying even that he had eaten Toot berries. For some days subsequently he was drowsy, and scarcely master of his actions, but he gradually became quite well. The only treatment had recourse to was a mustard emetic, but the recovery under this treatment seems to have been less rapid and satisfactory than under the blood-letting in Mr Martin's case.

In the Dunedin district such cases of poisoning from Toot berries have now become rare, especially among the older settlers, because, on the one hand, the poisonous character of these berries is now abundantly recognised, and on the other the plant is now comparatively scarce, disappearing gradually under cultivation and the introduction and spread of alien or immigrant (mostly British) weeds.

CASE III. Reported by Mr Stewart, of Raglan, Auckland province, who was himself the sufferer.—He had been in the bush; and being tired and hungry, with neither food nor drink of a more suitable kind at command, he ate a large quantity of Toot berries, including the seeds. During the night he was seized with delirium, accompanied by great muscular excitement and violence, resembling that of acute mania, necessitating the assistance of several men to restrain him. He was treated by means of some mineral poison, which was said by his medical attendant to be the antidote of the vegetable poison of the Toot, while water was thrown about him, and minor remedies were employed. He made a gradual, but, as in the other cases, a complete recovery. It is here most doubtful how far the presumed antidote proved efficacious, so that it is the less to be regretted that we are ignorant of its precise nature.

CASE IV. Reported to me by John Hislop, Esq., of Woodburn, Saddlehill, inspector of schools in Otago.—A girl at Saddlehill nearly lost her life from eating Toot berries some years ago. The prominent symptoms were retching, vomiting, and convulsions, and the principal treatment emetics. She never completely recovered, there remaining to this day a peculiar form of nervous irritability not observable prior to this Toot-poisoning. It is questionable, however, whether this sequela is a "propter hoc" or a mere "post hoc."

B. *On the Lower Animals.*—In cattle and sheep the symptoms are of a parallel kind; there are usually one or other or all of vertigo, stupor, delirium, and convulsions. The affected animals generally stagger or reel, as if intoxicated; kick violently, and apparently causelessly; wheel round and round suddenly and rapidly; course swiftly over the country aimlessly, breasting all manner of impediments. In this condition they frequently rush blindly into pools and creeks, and are drowned. Both cattle and sheep—perhaps especially the former—are constantly being lost in this way alone. Sometimes they are affected with general tremors; frequently they die in convulsions resembling those produced by the toxic action of strychnia. Popularly, "tooted" cattle are said to be mad, especially in the wheeling and steeple-chasing form or stage of Toot-poisoning.

In different districts of Otago, and in the experience of different settlers, the details of Toot-poisoning in cattle and sheep are the following:—

In the Green Island district, near Dunedin, the cattle usually affected are young cattle freshly imported from Australia, in low condition and with empty stomachs. Arriving in spring, they are ravenous, and greedily eat the tender young shoots of Toot—a very few of which, under such circumstances, are sufficient to affect them. Some of them, when tooted, wheel round and round as if giddy, until they suddenly tumble over; and it is regarded a favourable sign, promising recovery, when, in the course of treatment, they can be got to move about somewhat in straight lines. Others shiver and become convulsed; while some rush wildly over the country as if "possessed," or running a steeplechase, bolting at or over all obstacles, and frequently dying in convulsions. Newly landed sheep are similarly affected under similar circumstances, causing great distress to their shepherds, who frequently awake of a

morning to find several scores—quite well on the previous night—"tooted," and dying or dead. Working bullocks are also sometimes similarly affected after a hard day's work, especially in warm weather. On the other hand, cattle become habituated to the use of Toot, which is to them reckoned a fodder as rich and as safe as clover. Seldom or never are old, seasoned cattle affected by Toot. The enormous mortality in cattle and sheep on their way to and at the diggings from Toot-poisoning probably arises simply from the facts that the animals are mostly new comers, arriving in poor condition, starved or starving, and unaccustomed to the use of Toot, of whose baneful properties further their custodiers, also fresh arrivals from Australia, are ignorant. In the case of acclimated animals belonging to Otago settlers, the mischief arises probably from the accident or necessity of their feeding on Toot, after the depressing fatigue of long and toilsome marches with enormous loads, in the absence frequently, from its expensiveness or scarcity, of a more suitable fodder. Sudden deaths frequently happen from eating in the morning and after rain the fresh, juicy, young shoots. *Post-mortem* examination in these cases reveals great distension of stomach and intestines, similar to that produced sometimes in this country in cattle or sheep gorged with rich green clover under unusual circumstances. The settlers are unaware of any other pathological peculiarity.

In the Lower Clutha districts (Inch Clutha, Warepa, Waihiku, &c.) the settlers remarked to me that the Toot appears to take effect only when the cattle lay down to ruminate, and that some of their heaviest losses occur after a night's frost. They regard Toot as most dangerous when the evening is dewy, or after rains, which add to the juiciness and attractiveness of the plant. Frequently no bad effects are perceived till the cattle are made to get up and move about, when the narcotism begins to be apparent. Cattle feeding on grass pastures containing only a slight admixture of Toot are unaffected; but if, after feeding for a time on grass alone, they are suddenly transferred to pastures where Toot prevails, and especially if they are turned out in spring on bare land, the herbage whereof was burned in the preceding autumn, where Toot is the first plant of any dimensions that sends up its tempting green shoots, the latter are eaten greedily, and the danger is great, if death is not certain.

In the North Island, at Wanganui, Captain Blewitt says: Bullocks and sheep, if first fed on Toot, would die, and sometimes do die in great numbers; but the danger is recognised, and they are generally fed previously on grass, and gradually accustomed to the addition of Toot. In Wellington, Toot is frequently very fatal to bullocks, especially over a tract known as the "Peninsula." Generally speaking, the newer the district, the greater the prevalence of Toot and the comparative absence of grass pastures, the greater the consequent risk to sheep and cattle from Toot-poisoning. In old settled districts, therefore, where good grass pastures are plentiful and Toot is fast disappearing, Toot-poisoning is rare.

In the Raglan district, also on the west coast of Auckland province, Mr Stewart tells me, cattle are occasionally poisoned by the young shoots, but always under some such circumstances as the following:—The animals have been feeding in the bush where there is no Toot, when they are suddenly driven upon lands where the young sweet Toot-shoots are just springing up; they are very fond of them, and eat them greedily. The chances are, that they are speedily "tooted,"—stagger, then whirl about, kick violently as if delirious, and frequently die in the course of the first night. The dead animals are found greatly "blown," or swollen. But Mr Manning's idea, that death results simply from over-feeding, and the swelling of the succulent food, and that it would be equally produced by young grass, is not regarded with any favour by the majority of the North Island settlers. As a rule, Toot is much less feared in the North than the Middle Island—as it appears to me, for the following reasons: I saw far less of the plant in Auckland than in Otago, and it would seem to be comparatively much rarer in the north than in the south of New Zealand, in proportion especially as open land is more abundant in the latter than the former. Flocks and herds and pastures are insignificant in Auckland as compared with Otago, so that thus the opportunities for mischief are greatly less in the North Island. In Coromandel, for instance, I was told that Toot is not very fatal. But the country is mostly forest-clad; there is little or no Toot, and few cattle or sheep. Even here, however, cattle are occasionally "tooted," the general symptoms being that they become "wild," "mad," and die in convulsions resembling those from strychnia. This accident occurs only in the case of hungry and imported cattle, and was more common when the district was first settled and the cattle were new-comers than now, when they are habituated to the use of Toot. The animals tooted become "blown,"

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"Horses," says he, "eat of the Tutu berry wholesale—stalks and all—with impunity. I have seen them devouring the Tutu with the greatest avidity, and I have never known an instance of a horse being injured.

"I do not know an instance of any horned cattle eating the Tutu berries. Though I have hundreds of times seen cattle in the Tutu scrub, when the berries were ripe, I never saw them eating the berries; and, if they do, I feel sure they are not injured by them. No cattle are ever found dead here, or very seldom, at the time the Tutu berries are on the tree; or, if so, the death can be accounted for in another way than as arising from the berries.

"Cattle are, however, sometimes killed in whole herds by eating the Tutu, but not the berries. As the berries are known to have a poisonous effect on the human subject, this has, I think, caused the idea that cattle are also killed by the berries. This is, I believe, a misapprehension to be explained as follows: The Tutu bush grows in general in the midst of thick fern, (Pteris aquilina, L. var. esculenta, Forst.) This fern grows from four to seven feet high in many places, and every third or fourth year becomes dry, and either catches fire accidentally, or is set fire to, to clear it off. When this occurs, the Tutu bushes are burnt off also level with the ground. This happens generally in the summer or autumn. During the next spring the root throws up great numbers of green, sappy, succulent shoots, which grow with surprising rapidity, and exactly resemble gigantic asparagus, as thick as a man's arm, and six feet long, before they begin to have the consistency of wood. These shoots are of a very bright green colour, and are so watery inside as to have barely sufficient consistency to stand upright. The least touch breaks them off like an icicle. Now, the cattle devour these shoots with the greatest greediness, and as almost a matter of course die. But these shoots are not, properly speaking, poisonous; in moderate quantities they do cattle no harm at all, but when the cattle are killed, which they are sometimes in whole herds, the symptoms are exactly the same as those arising in Australia from eating too much at once of the young spring grass, or in England from eating green clover. In fact, the cattle are, as we used to say in Tasmania, 'blown;' I don't know what they call it in England. The same remedies as used in Tasmania and England are equally efficacious here, though seldom used, people being very careless, and in general letting the cattle live or die, as the case may turn out.

"I have never known either sheep or pigs to receive any harm from the Tutu berries, or from any part of the plant. Nor, indeed, have I ever observed that sheep or pigs feed on it, though I have had a flock of sheep and great numbers of pigs running amongst groves of Tutu for twenty years. Certainly I have never lost a sheep or pig from this cause, and I know to a certainty that both sheep, pigs, and horses refuse to eat the green shoots, which the cattle are so fond of, and which are so fatal to them.

"To the best of my belief I have never heard an authentic instance of any of the inferior animals, large or small, having been injured by eating the Tutu berries, or even the berries with the supposed poisonous stalk having the fur I have mentioned; *though* it is no doubt quite likely that they might be poisoned if forced to eat them *contrary* to their natural instincts.

"I shall again mention, that several kinds of birds feed freely on the berries.* Sheep and pigs I have never known to eat any part of the plant, or to be injured by it. Cattle I have never known to eat the berries, but they are killed in numbers by eating the green shoots. Horses refuse these shoots, but eat the berries—stalks, fur, and all—with impunity. But I must also remark that, for one horse that eats the berries, as I have seen, there are fifty that wont touch them; those which I have seen eat them in large quantities have suffered no bad effects whatever."

§ 6. Conditions which Regulate its Action.

There are certain peculiarities connected with the action of the Toot-poison, which are worthy of attention. Under certain circumstances the Toot plant would appear indeed not to be poisonous; the exemptions are sufficiently frequent and marked to lead a small class of observers to doubt altogether its poisonous character, and to explain the so-called poisonings in other ways. My own inference, from very conflicting evidence, is that the plant undoubtedly contains a poisonous principle; but that this poison requires certain favouring or predisposing circumstances or conditions for the development of its action.

Cattle and sheep are generally the subject of Toot-poisoning under some of the following conditions:—The plant is young and succulent; it is perhaps more so after rain. The animals are hungry and voracious; perhaps they have just landed from a fatiguing sea voyage, and are underfed or starved, in bad physical condition generally, the stomach empty; or the bullocks are jaded with overwork, and have been feeding on unpalatable dry fodder; or they have been suddenly turned out of a pasture containing no Toot into one on which it abounds; or they are simply turned out on the highways and byways after a day's ordinary hard work under a hot sun; or it may be spring, when the favourite juicy shoots first appear, and the animals have not tasted them for many months. In a word, the animals in these cases are not habituated to the use of the plant. But a peculiarity resides in the fact that cattle, which have been habituated to its use, do not suffer; not only this, but Toot is then reckoned one of the richest and safest pasture foods, quite equal to clover. It is as great a favourite with the animals, whether they are habituated or not.

A correlative circumstance here to be noted is the fact that, while certain animals seem to be exempt from, or insusceptible to, their toxic action, they may, by feeding on certain species, or certain parts of certain species, of Corearia, and assimilating or secreting the poison in their tissues, communicate poisonous effects to man or the lower animals, to which the first-named animals become food. This happened in 1862, in connexion with C. myrtifolia several persons near Toulouse having been poisoned by a dish of snails, which had been fattened on its leaves and young shoots, the symptoms having been those of narcotico-irritant action. The poisonous principle would appear to have passed unchanged through the digestive system, and to have been incorporated in the tissues and secretions, of the snails, which were themselves *un*affected thereby; and we now know that the vegetable alkaloids can pass through an animal system undecomposed, and are detectable, under favourable circumstances, by appropriate tests. Instructive parallel cases are those of poisoning in the human subject by eating the flesh of hares which have browsed on Rhododendron chrysanthemum; or of young pheasants, which have fed on the shoots and buds of Kalmia latifolia; the honey of bees, which have sipped it from certain species of Azalea, Kalmia, and Rhododendron; as well as the ever-quoted and over-quoted instance, from Xenophon's narrative, of the Ten Thousand Greeks, in their "retreat," who died in consequence of eating honey collected from the Azalea pontica—the Ægolethron of the ancients; the symptoms in all those cases being those of narcotico-irritant poisoning—vomiting, purging, and giddiness. An additional illustration was afforded two or three years ago by the narrative in the public prints of a case of poisoning in England by the flesh of Canadian partridges, which had fed on some particular noxious plant, not affecting themselves, but the poison contained in which was highly dangerous—in one case nearly fatal—to persons partaking of their cooked flesh.

I have met with New Zealand settlers who have been "tooted" on certain occasions, but who have, on certain other occasions, eaten with impunity Toot berries, in

* They are, when ripe, the favourite food of the "Kakapo," or night parrot, (Strigops habroptilus.) which, like so many other native birds, is fast following the gigantic Moa to its doom, extinction.

equal quantity, and apparently under parallel circumstances. Colenso, who ought to be a good authority, goes the length of asserting that the less juicy berries of the several New Zealand Coriariæ have seeds that are not poisonous! A parallel fact, in regard to another species of Coriaria, is the statement by Royle that the fruit of C. Nepalensis is frequently eaten without inconvenience in the northern provinces of India; though it is doubtful here, and in similar cases, whether the seeds were consumed along with the succulent or pulpy part of the fruit. In regard to the more familiar C. myrtifolia, Peschier of Geneva states that tanners, who employ its leaves as an astringent in tanning, use it also habitually for gleet, and that he gave a decoction of an ounce to dogs, chickens, and men, without any bad effects! Such conflicting statements show that there are peculiarities in the action of the poisonous principles of the Coriariæ, which require explanation at the hands of experimental toxicologists and chemists, and which explanation can only be the result of thorough scientific investigation.

§ 7. Treatment of Toot-Poisoning.

A. *In the Lower Animals.*—In different parts of New Zealand different remedies or antidotes are employed in Toot-poisoning in sheep and cattle. Of these, by far the most common is bleeding, especially by slashing the ears or tail; and it is no uncommon event at a large sheep or cattle station for all the "hands" to be busily engaged in the wholesale slashing of the ears or tails of tooted sheep or cattle. Belladona has been variously tried, and favourably reported on; and various stimulants are by some regarded as specifics, such as carbonate of ammonia, brandy, and a mixture of gin and turpentine, locally known as "drench." Whatever be the nature of the remedy to be applied or employed, there is no difference of opinion as to the necessity for the promptest treatment, for at a certain stage of the action of the poison all remedies appear equally inefficacious.

It is generally recognised as a rule that cattle and sheep which are known to have fed on Toot, but which are as yet exhibiting none of the active signs of poisoning, should not be interfered with by herdsmen or dogs. For it has been abundantly proved that, while the narcotic effects may gradually pass off if the animals are left quite undisturbed, if dogged, excited, or frightened, or if caused to get up from the reclining posture of cud-chewing and move about rapidly, the poison at once becomes active and dangerous, and some of the symptoms or phenomena already described are manifested. In other words, no remedy, no disturbance is admissible till decided symptoms of poisoning have been manifested. Up to this period perfect rest and quiet are the only appropriate treatment.

The following may be cited as illustrations of the varying practice of the local veterinarians, amateur or professional, in different districts and under different circumstances:—

In Otago the Green Island settlers slit the ears of "tooted" cattle, and encourage profuse bleeding. This is their only treatment, which they apply equally to sheep.

In the Taeri, affected sheep are frequently plunged into a pool of water, or are dosed with brandy.

In the northern districts of Otago the flockmasters bleed "tooted" sheep from the eye veins that run up each side of the angle or root of the nose, or from the roof of the mouth. This bleeding generally proves speedily effectual, if the animal is to recover; it is heard to give a marked sigh as if of relief, and this symptom is regarded as the first herald of progress towards restoration. For about two days after this operation, however, the animal appears as if in a state of intoxication or semi-stupor. Carbonate of ammonia is also frequently used with good effect by the shepherds; a lump, about the size of a walnut, is dissolved in a pint of water, and a wineglassful is poured down the animal's throat. Cattle are treated in a like way, being bled from the roof of the mouth or from the tail; never from the ears in certain parts of Otago. So sudden and general is often the seizure, so large the number of animals "down" with Toot, that all the inhabitants of a large station on such occasions are busied, with an earnestness and activity that indicate the importance of the interests at stake, for hours, if not for days, bleeding wholesale, as, under such circumstances, remedies cannot be too speedily applied, and every moment may be fraught with the death of valuable "stock."

(*To be continued.*)

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THE VETERINARY REVIEW

AND

Stockowners' Journal.

ORIGINAL COMMUNICATIONS AND CASES.

Cattle Importation. Is it as it should be? The Cattle Plague. Is it Indigenous to British Soil? Is Treatment Desirable? By G. ARMATAGE, Prof. Vet. Mat. Med., Albert Veterinary College, London.

THE principles by which our commercial relations with continental powers are accelerated, likewise admit of the development of contingencies which often frustrate the ends originally intended. In short, abuses arise, and are perpetuated under the title of free trade, and results are brought about, which, while they fill the coffers of the promoters, prove highly detrimental, if not absolutely ruinous to a whole community. Influences then exist, which, as being in themselves the offspring of the parent principle, it is not felt necessary to retard, and the progress or decline of the whole body becomes concentrated in the grasp of a few individuals.

Such is our present position under the scourge which is now devastating our herds. The spirit of dissembling as the spirit of trade is too much the fashion—it is as essential to success now-a-days as the goods which are to change hands by its adoption. There is little genuineness in most of our transactions. Who ever heard the Billingsgate merchant confess that his fish was tainted? The dairyman that he sold *water* and *milk?* Or the tobacconist own his dependence upon lettuce leaves as an imitation of the "delightful weed?"

We have known a youthful wine at ten shillings a bottle objected to, but afterwards accepted on the addition of half-a-crown to its former price, and a dash of mucilage and sawdust over the outside; in reality, it has now become an aged beverage, and so long as the consumer is a pseudo-judge in these matters, there is considered nothing radically wrong to be complained of; but woe to him who shall declare the defect. Nothing wounds so keenly as truth, particularly when it exposes the weakness of the one or the cunning of the other, and more so as regards the latter when the deception has hitherto proved lucrative. As in matters of ordinary trade, so in the

present system of cattle traffic. The public are loath to believe that importation of live stock can have been so detrimental as it has been so frequently stated. The supply of foreign cattle which is constantly brought to meet the as constantly-increasing demand in England for beef is looked upon as too great a blessing to be possessed of defects, and importers as constituting too valuable a class of individuals to be placed under the necessary restrictions here which other countries enforce to compel them to act up to the spirit of honest dealing. However foreign the cry of "*tainted fish*" would appear on the stones of Billingsgate, it would be quite as euphonious as "*diseased cattle*" from an importer of foreign stock. The consequences attendant upon the act are of too profitable a nature to be allowed to luxuriate outside the arcana of the craft. Any exposure of such would be deemed an interference with the principles of the trade, and in our irresolute demands for beef, we are supplied as a matter of necessity, and also have to take it as we find it.

"A sad thing this cattle plague," remarked a dairyman to a cattle salesman during the past month; "it will, I am afraid, carry off all my stock." "The more the better," was the reply; "*it's all good for trade, you know.*" Pleuro-pneumonia and vesicular aphtha have not done sufficient by their thousands of slain, but the cattle plague will doubtless be ample. Probably, therefore, we may be aroused to a sense of the importance of the consideration, whether the benefit of a class who, because they never underrate their wares, shall be placed in a side by side comparison with the health, wealth, and safety of the population of a whole kingdom, merely to avoid the apparent necessity for a remodelling, or reconstruction, of an imperfect system, and by which a subterfuge shall be swept away to give place to honesty of purpose and fair and above board, plain dealing.

It may seem hard that the public will not give credence to their protestations, but we are not bound to accept their wares on the strength of such, particularly when we have had so many doubts of their veracity.

Cattle importers tell us by various channels, many years' experience convince them that no cattle are introduced which bring disease with them. Why, then, should we have, contemporaneous with importation of cattle, pleuro-pneumonia and vesicular aphtha, and with sheep small-pox, &c.? Such diseases are well known to all who have studied the question scientifically, as being generated abroad, and only conveyed hither by the loose system referred to. It is also well known that they *never* existed in this country prior to the introduction of numbers of foreign cattle;* but for ages have prevailed in Western Europe, as a result of a process of smuggling, by which diseased animals are brought from the pestiferous districts of Eastern Russia and Asia,† where it is alone generated. Whenever the movements of large

* "Report on Murrain in Horned Cattle," by E. Headlam Greenhow, M.D.
† Ibid.

armies have taken place in the districts referred to, which necessitated the employment of oxen, there the diseases also travelled, and decimated the camps. One of the most recent instances, and therefore the freshest in the minds of the people, being that which occurred during the memorable Crimean war.

I have no doubt myself about the difficulty of realising such facts in the minds of interested parties, nor do I consider it probable, or inevitable, after a lucrative experience of thirty or forty years, that a trader would adopt a confession of guilt, and particularly—even if he had the ability—by a scientific solution of the question which has enabled him to gull the people during that time, and from whom his proceeds have been derived. We have as great reason to suppose that the sparrow, in the well-known nursery rhyme, should have treated us to a complete account of the morbid appearances and *modus operandi* in which the fatal dart worked its bloody effect on the innocent victim, in place of the laconic truth, "I killed Cock Robin."

That the cattle plague is indigenous to British soil does not become, in reality, a settled question, because a party of importers and others, equally as incapable of forming any judgment on the matter, choose to asseverate the statement. If we acknowledge the existence of "*honour among thieves*," surely there is a species of that principle also existing among cattle-dealers recognised by a similar appellation; an honour which comprises the whole technicality and free-masonry of the system of importation and traffic,—an honour which means *selling and making money*, and, as a result in this instance, as in the case of *imported pleuro-pneumonia, vesicular aphtha, or mouth-and-foot complaint* in cattle, and *small-pox* in sheep, *from the disasters of the people.*

The honour existing among horse-dealers is now, by experience, fully appreciated, and we are by no means departing from a rational principle of reasoning in prognosticating that analogous results may probably be brought about in the present crisis among the class to whom our allusions have special reference. John Bull is an easy-going fellow, and evidently requires being "*plagued*" before he bestirs himself.

That the cattle plague is not indigenous to British soil there is abundant proof, notwithstanding what has been advanced by the supporters of the present system of importation, or those who pin their faith to the imperfect sanitary state of our metropolitan dairies.

As a malignant and highly contagious disease, running its course with extreme rapidity,—if capable of spontaneous generation in England,—how does it happen that for more than a century it has not been witnessed here? If it is not contagious, nor generated by filth and neglect of sanitary regulation, how comes it that sheds have been visited, and the cattle swept off by the disease, when no communication has existed between infected places, and the cleanliness and venti-

lation is of the most admirable order? But such has been the case in many instances.*

Again, if a want of cleanliness is the actual cause, how does it happen that London dairies, which are licensed and under close inspection, should be the first to produce the plague.† When cow-sheds can be found in town and country throughout the provinces *under no sanitary supervision whatever*, and representing a thousand times more extensive all the characters of Augean filth and offensive accumulations,—if really neglect of cleanliness gives rise to cattle plague, we surely have had ample cause for its development on many occasions since 1759. Our progress in science and application of it to sanitary purposes have proved of little or no avail also, under these circumstances, and we are in reality farther off instead of being nearer to the desired end, that of purification and disinfection. But we well know this to be the contrary of truth, for never were we in a more safe position, as far as that is concerned, on the one hand, and as far as disease is understood on the other. All who have really studied the question of cattle plague here in its modified form, and on the Continent in that recognised in the districts peculiar to its production, agree in the one declaration that the disease now affecting the cattle of this kingdom is the *Russian plague*, the *whole plague*, and *no-*

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* To wit, the stock of Earl Granville, Miss Burdett Coutts, and many others, as decisive instances.

During the past month I have examined several cow-houses of the cleanest and most admirable construction, where the whole stock have been carried off; in one case, thirty cows were seized successively; in a second, twelve; and many of smaller numbers. A few days ago I was accompanied into Kent by Professor Bouley, from the Alfort Veterinary School, France, to examine and report upon the state of sixty of the finest dairy cows, all selected with the greatest judgment and care. Two days previously they were reported by eminent men to be apparently free from disease. On our visit, two were affected severely. Here Professor Bouley was delighted with the beautiful arrangements and systematic order of everything; yet the introduction of the plague to this establishment, as well as those already mentioned, is a perfect mystery. No fresh stock had been introduced for months, and all communication had been cut off from motives of rigid determination to avoid if possible the disease.

As cause likely to produce it in the London dairies, untrapped drains are doubtless not without their mischievous effects, when we consider the extent to which the plague has prevailed, diseased cattle, and excrement carelessly removed, and doubtless impregnated drains and sewers with the germs of the animal poison.

In one instance the flesh of cows had been purchased from a dealer in inferior meat and maker of sausages,—to feed dogs on the farm,—here fifty cows, one bull, and seventeen cows were lost. In a second, a butcher had taken offal of diseased cows across the farm to bury a few fields beyond.

† The first case of plague which appeared in the London dairies was observed in two cattle purchased on the 19th of June in the metropolitan market, and taken to the neighbourhood of Lambeth. One of these sickened and died on the 27th, the second, however, recovered. About the same time it appeared in the stock of Mrs Nicholls's dairy, Laycock's farm, Liverpool Road, Islington. Mrs Nicholls says,—"In less than a fortnight eighty-five cows were sacrificed. Her stock, consisting of 116 shorthorn cows, had cost £2530, at £22 per head; and she had expended £48, 17s. in medical advice, cartage, and other costs, making £2578, 17s. Of her cows 100, which she was obliged to sell at a great loss, had realised £536, 6s. Sixteen had been carted away and buried, and the total loss she had sustained amounted to £2042 odd." *On the* 14th of June diseased cattle were noticed in the above market in the hands of *dealers.*

thing but the plague. Unless we can prove that our beautiful green pastures are the dismal swamps, and pestiferous marshes of the Russian or Danubian steppes, we fail to find material for the development of the germ by which the disease is generated; and unless—even after its spontaneous origin were proved or admitted—we can prove its influences peculiarly as an enzootic in comparison with its effects on Russian cattle, and diseases generated and propagated among our own animals at home, we fail to establish the least tenable ground for the assumption that the Russian cattle plague is really of English origin.*

Greater evidences of the desire to furnish sensational articles for leading journals—by those strong in their condemnation of alarms—cannot be found than in the vague attempts to discuss the theory and benefit of inoculation for preventing the spread of rinderpest or steppe murrain; and no better are required to show the lamentable amount of ignorance which prevails without the professional circle, not only upon this but on epizootic diseases generally. Should any one doubt the influence of inoculation, or wish to test the efficiency of the system, it can be thus fairly accomplished. Let him pay personal attention to the inmates of *his own* cow-shed in which the disease must be introduced, where the animals stand two-and-two in stalls, feeding from the same trough, partaking of the same food insalivated by each other, and here he will find the result of inoculation being evidenced in the potent arm of death—as conclusive for inoculation as for contagion—upon which eccentricities and doubts are entertained as strongly as a superficial observation is well known to engender.

By some it is believed and taught that the plague is a disease partaking of the essential characters of vesicular aphtha and pleuro-pneumonia in the ox-tribe, small-pox in sheep and man, and strangles in the horse, whose peculiarities depend upon the fact that animals are only once affected by them during a lifetime. It is not my intention here to enter into a discussion as to the probable amount of truth attached to this statement as regarding the above-named diseases, *but with steppe murrain I believe it to be perfectly true;* there are two terminations to its progress, viz.—*a.* protracted recovery; and, *b.* rapid death.

a. *Recovery in instances amounting to from* 3 *to* 5 *per cent., without much regard to medicine, leaving a carcase valued at one-eighth its former value, with a heavy mortgage upon it for loss of time, milk, food, &c., &c., and the prospect of always being an invalid, or shortly dying from a combination of causes. And,*

b. *Death in eighty to ninety-five cases out of every* 100 *animals affected.*

In the former we do not gain much encouragement or benefit by the belief, but in the latter have abundance, which not only decides the true malignant type of the malady, and inevitable results of its

* Edward Bascomb, M.D., on Epidemic Pestilences.

attack once in the lifetime of the individual, but that stringent and energetic measures should be at once instituted when its appearance takes place, measures which, even in the form of the much-despised though honest knife and pole-axe, have not yet been surpassed in this disease as a profitable proceeding to the owners, or means of safety to a neighbour's cows, *in fact, to the stock of the whole kingdom, valued at eighty millions,* by any means which are promulgated by those who consider it unprofessional not to "*throw water on a drowned mouse.*"

Russian steppe murrain appears in those countries in which it arises spontaneously, as an enzootic, spreading slowly, and by no means so fatally. This is to be accounted for in the fact that animals who are constantly subjected to miasmatic exhalations and pestiferous soils, water, deficient food, &c., with other vicissitudes of an atmospheric character, are acclimatised, and withstand the effects to a far greater extent than cattle of other countries like our own, or those of Holland, France, Germany, &c. &c., but the moment such a disease is introduced to another soil and climate, it becomes most malignant and fatal.

Every one knows that small-pox in the human subject, and pleuro-pneumonia and vesicular aphtha in cattle, are not so fatal as formerly, and these peculiarities are to be traced to the extent to which the diseases prevailed by which the human and animal frames are not so susceptible of the poisonous influences of the disease during its prevalence.

A knowledge of these facts, together with the numbers of lives which have been sacrificed during this probation, with positive proofs of the only means by which the disease is propagated, viz., contagion, should aid us in our judgment as to the propriety of adopting any line of treatment for the cure of such a malady as the cattle plague.

Inoculation might do, provided we could afford to lose, every ten years, twenty or thirty millions' worth of stock, in order to render the system less susceptible of the poison of the plague; and any other remedial treatment may be adopted with nearly equal disadvantages, if we wish to occupy ourselves in the emptying of medicine bottles, merely to witness negative results, and allow inoculation to proceed of its own accord, at random, but most marked.

No one knows more about the results of medical treatment for the plague than the Austrian, Prussian, and other veterinarians on the frontiers of the pest-ridden countries, and they should form some guide to us in our present crisis. Even where it arises more from an enzootic character, there are difficulties in the way of successful treatment; these, therefore, *must* be proportionally greater *here,* where its propagation and course are so certain and rapid.

Dr Furstenberg of Eldend, and other continental medical men and eminent veterinarians, inform me that many experiments have been repeatedly instituted at Vienna and other places in Austria and Hungary, in which latter place the plague now again rages with violence,

and the results have been *not* in favour of medical interference, for animals have recovered from the worst forms as rapidly without medicines as others who have received all the attentions and assistance to be derived from a well-organised system of administration. Our experience in England fully corroborates this.

Greater reliance is to be placed on preventive measures, such as careful selection abroad, and in districts well known to be healthy, with rigid inspection, rejection or quarantine where doubt or disease shall exist, as the case may be. Surely all these measures, even though their obstructiveness may be admitted, can only be evils for a time.

Is it possible that importers would risk many diseased cargoes to England if interruption is certain? On the contrary, they would change their tactics, and turn their attention to other and healthy districts. Beef is wanted; John Bull must be supplied.

The demand is opened out and importers rush to supply that demand; and I maintain that, as importers are not supposed to run across the Channel unless in the hope of gaining by the transaction, we may reasonably consider the results to be of a mutual character, and the privilege be ours to stipulate that our necessity for beef is no justification for imposition.

If we need foreign cattle for home consumption—which few will have the temerity to deny—in the name of all that is honest and English, for the sake of the health of our families and population generally, as well as the safety of our beautiful and unequalled breed of cattle at home, let us have them come with clean hides, in clean ships, and with sound healthy bodies. Is this too much to ask? if so, all honour and rectitude in cattle importation is a dead letter.

Our hitherto perfect belief in the correctness of the system, and the curability of the resulting disease, has already swamped millions sterling, and our home stock is still fearfully threatened; whereas, prompt measures, well directed at the outset, would have effected a total exclusion under as many thousands.

VETERINARY OBSTETRICY.

[The following lecture was delivered before the Lancashire Veterinary Medical Association, by Mr W. A. Cartwright, M.R.C.V.S.L., Whitchurch, Salop, in the Royal Institution, Manchester, on Wednesday evening, 6th September 1865—Peter Taylor, Esq., veterinary surgeon, Manchester, president]:—

Mr President and Gentlemen,—I assure you it is with very great pleasure that I have to address you this evening on a subject

which I conceive to be of vast importance to every one who enters into the veterinary profession, especially so to those who are destined to practise in an agricultural district.

It was unfortunate for me to be placed apprentice to one, otherwise a first-rate practitioner, who was anything but an adept in cattle practice; and during the whole time that I was with him, I had not the opportunity of attending a single case of veterinary obstetricy, (from the Latin, *ob*, before, *sto*, I stand—the art of midwifery—*obstetrix*, a midwife;) and equally so was I unfortunate at the Veterinary College in London, as I never heard a single lecture, or a word of advice, given on the subject during the whole period I was there, either from Professors Coleman, Sewell, Spooner, or others; and of course you may well imagine that I was, as our diploma states, perhaps anything but qualified "to practise the veterinary art," so far as *cattle practice* was concerned; but upon this dark side I will not dwell, as a brighter day has dawned upon the Veterinary College, as there is now one filling the chair on cattle pathology fully competent to treat and illustrate, from practical experience, this branch of our profession. I can well remember that the first case I was called in to, on commencing practice, was one of inversion of the uterus; and you may well imagine with what consternation and awe I looked upon the immense protruded mass that lay before me. However, after taking a common-sense view of the case, and reasoning on the best method of re-inverting it, I saw no better way of replacing it than after separating the placenta, by placing my fist at the centre of it whilst others assisted me by pressing against its sides, and so forced it back into its proper position; and I am happy to say I was successful, and I was by those around me stamped as a first-rate veterinary accoucheur. Of course, at this time I found myself far better prepared to practise on the horse than on cattle, but as I saw that it would be rather inconvenient for me to be attending the horse, and a cow doctor the cattle, I fully made up my mind to extend my practice, consequently I entered fully into cattle practice; and from that day to this I must say that I have had my fair share of it; and you who know what cattle practice is can well imagine, during a forty years' practice, what labour and drudgery I have gone through.

The subject that our worthy and respected President kindly solicited me to bring before your notice this evening, although it has given me a great deal of trouble, has been a labour of love. In a great measure it has been untrodden ground, but with me I have made it a sort of hobby for now many years, and the greater part of my experience has been laid before the public in a variety of papers in the various volumes of that invaluable periodical the *Veterinarian*—a work, from its commencement, that I would *strongly* advise every one to be possessed of, as it contains a mass of information on every veterinary subject, but especially so on this, which can only be obtained in this country therefrom. There is also much valuable matter in the volumes of the *Edinburgh Veterinary Review*, both on this and

other veterinary subjects, which I should also advise to be purchased.

With the exception of some observations by Skellett, published, I think, in the year 1807, and of Dobson last year, I am not aware of any work ever being published in the United Kingdom on the extraction of the fœtus of domesticated animals. Mr Simonds, I am aware, delivered an address before the Agricultural Society on the subject, and which may be found in its *Journal*, and in the *Veterinary Transactions*, vol. v., p. 301, now defunct. Dobson's work on this subject is nothing more than a transcript from Simonds.

Some years ago, the lamented William Percivall, that giant in veterinary literature—a name that is venerated by us all—urged me very much to publish, conjointly with himself, a work on the subject, and for a time I was almost induced to comply; but from one circumstance or other, the affair fell through, and I declined it; but I must say a work on the subject is much wanted. In the second volume of the *Edinburgh Veterinary Review* there is an excellent review by Gamgee, I presume, of works by Gunther, Rainard, and Baumeister, and it is a great pity, indeed I think it is a disgrace, that they are not translated into English. I am thoroughly convinced that every veterinary surgeon ought to know the French and German languages, and others if possible, as they lose much valuable matter on every subject.

I cannot help stating, previous to entering on my subject, that I feel thoroughly surprised at the apathy shown by the agricultural community and gentlemen who ought to know better, in sanctioning the employment of such a set of ignorant pickpockets as they do. In other respects they show their judgment in every transaction, and study economy in every sense; but if a valuable horse or cow is to be attended to, they will either tamper with it themselves, go to a druggist, or else employ one of the most ignorant fellows that the community possesses, and all for the sake of a few pounds a year. I do not hesitate to say that thousands of pounds are lost around me every year by such conduct. This circumstance puts me in mind of a speech that I once read, delivered by Sir Harry Mainwaring at the Crewe Agricultural Society's dinner, on 30th September 1863, and I must say at the time it tickled my fancy very much, and since then it has often come into my mind. It is this: "One stormy night in the month of February he was passing a farm-house, and heard a voice in the cow-house. He looked in, and found a cow very ill. The cow doctor was there with a boy, and a tallow candle was stuck against the wall. Just as the cow required assistance, the candle fell and went out, and why it did not set fire to the whole building he was at a loss to imagine. He afterwards heard the cow died. He made inquiries who the cow doctor was, and found that he practised because his uncle had left him a few receipts. He charged 2s. for his visit, whereas a veterinary surgeon would have charged half a sovereign. So the farmer congratulated himself by saying he had

saved 8s., but had lost his cow. He (the chairman) thought *that* farmer wanted a skylight as badly as the cheese-room he had previously visited." (Hear, and laughter.)

As your time is valuable, I will not at present enter upon various preliminary inquiries, however interesting they may be, such as the duration of utero-gestation, and the symptoms of pregnancy, and of parturition, but will at once enter upon my subject; and I think that sometimes it is of as much importance to know what *not* to do as to do, consequently I will direct your attention to what may perhaps be called

Premature Labour, or False Labour Pains.—Now every one who is at all acquainted with veterinary obstetricy must be aware that sometimes he will meet with cases where the cow will show every symptom of parturition, such as enlargement of the udder, swelling of the vulva, a partial relaxation of the sacro-ischiatic ligaments, or what is commonly called "being off at the hips," and in addition to these symptoms she will every now and then be violently straining, which may naturally induce every one around her to believe that she needs assistance. Now, in such cases it will be necessary for us to pass our arm up the vagina, and ascertain whether there is any cause of irritation therein, and to examine the state of the os uteri, and ascertain whether there is any dilatation of it, or the least appearance of the "water bag;" but if we find that neither the one nor the other exists, our best plan will be to leave nature alone, and not attempt to force our fingers into the os uteri, so as to make a passage, which those around us may be anxious for us to do, as they have an idea that when once straining commences the calf must be got away. Now our best plan will be to limit her diet, give aperients, combined with anodynes, so as to allay the spasmodic action of the uterus, and irritation about the os uteri, when we shall find that the straining will in a great degree subside, and, in the course of one, two, or three days, relaxation of the os uteri will take place, and become fully expanded, and the cow will calve sometimes with little or no assistance. These cases are more frequent in heifers, but they are by no means rare in more aged cows.

In my early practice I have made attempts to dilate the os uteri in these cases, but I must say I cannot advise any one to adopt the practice, as it is irrational so to do, and the necessity of making an incision in the os uteri is, I think, very rare indeed. In some cases, where the calf lies upon its back, we shall find that there is not the usual pressure of the fore or hind feet against the mouth of the os uteri sufficiently to dilate it, but, on the contrary, every time the animal strains the feet are forced against the upper part of the os uteri and intestines, and in some cases the feet are actually forced through the side of the os uteri into the intestines, and which have appeared in the vagina. In these cases it may be prudent to watch our patient more carefully; and sometimes it may be necessary, gradually, to dilate the os uteri and get hold of the feet, and pass

cords around them, and get them to point into the os uteri, when the continued straining of the animal will gradually dilate the passage, and all will be well. Some few years ago, I recollect a farrier, who lived a few miles from my residence, and who was considered pretty clever in assisting cows to calve, being sent for to a gentleman's house, to a valuable Welsh cow that was supposed to have gone the full period of utero-gestation, in consequence of her being uneasy and straining. He made an examination, and declared that the mouth of the womb was so closed up, hard, and rigid, that she *never would* be able to calve, and that the best thing would be to have her killed for meat; consequently a butcher (my next door neighbour) was sent for, who, after a good deal of persuasion, advised the owner not to kill her, but that he would give a fair price for her, and give her a trial a little longer, which was agreed to, and he brought her home and immediately sent for me to examine her. I found her looking uncommonly well and lively, and on turning her into the field she ate greedily. Her udder was beginning to fill, but she was not at all "off at the hips," and on introducing my hand up the vagina, I found that the os uteri was not at all dilated, but in a perfectly healthy state. As she did not strain much, and there appeared but little the matter with her, and evidently not being at her full time, I advised him to give her a little sedative medicine and leave her alone. In the course of the day the straining ceased, and in about a week after she calved a fine healthy calf without assistance, and in a few days after she was sold *for* £14!

I will now direct your attention to the various presentations, and first of all, I must just observe that—

The natural presentation in the cow and mare is with the fore feet and head presented. In the sow the fœtus comes sometimes with the head and feet, but very often by the breech. In all natural presentations in the cow I would strongly urge the prudent plan of giving the animal sufficient time, so that the os uteri should be fully and gradually dilated by her own free efforts; and I do think it is very advisable not to rupture the membranes too early, as the encysted waters are the most simple dilators of the os uteri. On the other hand, we must not delay it too long, for when the membranes are ruptured the feet generally protrude and dilate the os uteri as much as is wanted, and the uterus then acts more powerfully. We shall also be able to ascertain whether there is a wrong presentation.

It is but seldom that mares require our assistance; but when they do, their cases are found, too often, to be very difficult ones; so that what is to be done for them must, if possible, be done quickly; for, when once pains fairly set in, our patient generally makes short work of it, and either forces the fœtus out or ruptures the uterus, and in some cases the intestines are actually forced out through the rupture into the vagina.

Some veterinary writer, that I cannot recollect, has said, the

assistance required in delivering a cow is mere *child's play* to what is required in the mare, and I perfectly agree with him.

Head only.—In these cases we must get the fore legs up in the ordinary way with our hands, or by fastening cords around the pasterns, and then draw them into the passage; but if we have not room, we had better force the head back into the uterus, and then get the legs up one after the other. In some extreme cases, when we cannot force the head back, especially so in heifers, and that have been roughly handled, we must remove it before we can get the legs up, and it will be advisable either to skin the head and separate it at the first or second cervical vertebræ, taking care that the ends of the bones are tied well over to prevent laceration.

Fore feet—head back.—This presentation is too often found to be one of the most difficult positions we have to encounter, and will tax all our strength, patience, and ingenuity, as the fœtus's head lies back against its sides and flanks, and is sometimes completely out of reach. This is especially the case in the mare, where the neck of the foal is often very long, and the mare's belly very pendent; and often it will be found that the head is not merely bent back, but is almost immovably fixed by contractions of some of the muscles; and in some instances the jaw is actually deformed and bent, by lying against the ribs.

In all these cases we had better secure cords to the legs, and then push them into the uterus so as to make room for our exploration. We must then try to get hold of the head by laying hold of the nose with one's fingers, or passing a cord around the lower jaw, or slip a noose around the neck—[shows it]—and so bring the head forward; but if we cannot do this, we must insert a hook into the orbit, and so draw the head up into the passage.

This we may either do with a hook (with or without a joint in it) with a cord attached to it, or with a long iron rod with the hook at its end. The latter I generally prefer, as the assistant, who has hold of the handle, can rotate it to its desired place, or move it backwards or forward as required. When we are pulling the head up we had better push against the chest, so as to make more room for the head.

In case we cannot get the head up, we have no other alternative than to remove one or both legs, so as to make more room, and get the head nearer by pulling at the flaps of skin that had surrounded the fore legs. Sometimes we have even great difficulty in finding the head; if so, it will be necessary to turn her over on her side or back.

My usual practice in removing the fore legs is this:—I first of all draw a leg out, and divide the skin as far as possible with this instrument that I have invented—[shows it]—or I introduce my hand, containing a knife, up as far as possible on the side of the scapula, and make an incision from there down the whole length of the limb to the pastern bones. I then perform what is called subcutaneous *dismemberment*, by separating the cellular tissue with the knife or *fingers*, or with this instrument—[shows it]—as far as possible sur-

rounding the whole limb; and having done so, I then try to cut through the transverse pectoral muscles connecting the sternum and shoulder. I then disjoint the limb either at the pastern or fetlock joint, having the foot, of course, attached to the skin, which is afterwards found very useful in drawing the body forward. I then fasten cords around the leg, just above the fetlock joint and knee; and having the cow firmly secured at the "boosy stake," and having plenty of hands to assist, we use the necessary force, and which is frequently very great, and draw the whole limb away. I have known, in some of these cases, of the limbs separating at the shoulder joints, and yet the fœtus has been extracted, both from the mare and cow, with the shoulders attached, the points of the latter having, fortunately, not caught the edge of the pelvis. The great danger in these cases is, that the shoulder joints may catch against the edge of the pelvis, and thus prevent extraction.

Previous to removing the limb, it is highly necessary to separate all we possibly can of the cellular membrane between it and the skin, and also to divide the transverse pectoral muscles, and as many of the other muscles attaching the body to the limb, which will lessen the force required, and the punishment of the poor animal. If necessary, and which is often found to be the case, we must remove the other limb in the same way. Having done so, we must now draw the body forward by the skin that surrounded the limbs, and try again to get the head up by the foregoing methods; and having got the head up we must remove the remaining part of the fœtus by pulling at the head and skin surrounding the limbs. Sometimes, after having removed the fore legs, we may be enabled to lay hold of the *hind* legs, and, if we are so fortunate, we may easily remove the remaining portion of the fœtus by the breech. Indeed, it will be no bad plan to force the fore feet in at first, and, if possible, to get hold of the *hind* feet and deliver by the breech. I may now just remark that in *all* cases where the head is presented, and not having passed through the pelvis, it is prudent, in many cases, to apply a pair of Nelson's blunt forceps to the nostrils—[shows them]—or a cord around the neck at the back part of the head, so as to bring the head well forward, as very frequently it is the case that the more we pull at the feet, the more is the head forced back.

There are instances on record, both in the mare and cow, where fœtuses have been extracted with the head doubled back on its neck, side, or flank, without removing any part of the fœtus, and expelled, in a great measure, by the efforts of the mother, and have survived; and such instances have occurred to myself, notwithstanding Mr Lawson of Bolton has asserted to the contrary such can never take place. See *Veterinarian*, vol. xxxiii., p. 141. Yet I hope no veterinary surgeon in the present day, who has any character for humanity, will dare to torture an animal whilst means are in his power to avoid it. Mr Dobson has said, that if we *cannot* get the head up into position, we must disarticulate it at the first or second cervical vertebræ; but

the breech also, and so make more room for the leg coming up. e cases, where we cannot bend the leg sufficiently straight at k backwards, it will be advisable to get the hock up as far as e into the passage, and divide the tendon of the flexor metatarsi, s to its bifurcating, just above and in front of the hock, which able us to bend the leg and flex the joint much more than . We must also be very careful the foot does not penetrate h the uterus; to avoid which, we must have our hand guard- foot, whilst with the other, or by an assistant or crutch, the is forced well out of the way. Having succeeded in getting well in the passage, we must adopt the same method in get- e other up. Now and then we are not able to get the legs t into the passage, but have to get the fœtus away by means ds around the hock or hocks, with one or more of the legs d forward against the thigh. In these cases it will be advis- divide the tendons at the back of the legs, just above the f the os calcis, and also the flexor tendons below the hocks, by means the flexion at the hock joints will be more perfect, and and thighs will better approximate. After we have done this, y pull at the cords around the hocks pretty freely, but we must it the forcing of the breech into the abdomen, so as to allow limbs at the stifles becoming straightened, and that the stifles ot stick against the anterior part of the pelvis. In some cases, known the fœtus to come away in a breech presentation, with- e legs being straightened at the stifles; but it is bad practice, if be avoided. In some cases we may remove the leg part, by the bone through close up to the hock, and afterwards passing above the os calcis to pull at, and then pushing the breech for- In the *Edinburgh Veterinary Review* for May last, I broached bject of extraction by the breech with one or more of the hind ying under its abdomen, or against its flank or flanks; and I confess I see no reason why the fœtus may not, in some parti- cases, be extracted in this position, especially so in those cases we have one hind leg out to pull at. I perfectly recollect, in one ce, delivering a cow of a very large calf with both of its hind legs its abdomen, and I never saw a cow after calving do better. having got the legs straight, we should make an incision into bdomen and remove its contents, as sometimes the intestines are d into a heap, causing a complete obstruction to the removal of ther parts. In those cases where we are unable to extract by reech, through not getting the legs up straight by laying hold of eet, or when bent at the hocks, we may make pretty free incisions gh the skin about the ilio-femoral articulations or rump, and wards cut or tear the muscles around these asunder, and then we secure cords around the iliac processes and coccygeal bones, and s against the edge of the obturator foramen, by which means we remove the pelvic and coccygeal bones; and having done so, we apply a cord around the heads of the thigh bones and pull them

I should like to know how such is to be done if it is so far off; and if it is near, the operation is quite unnecessary.

All four feet presented—head back.—Occasionally we meet with this presentation, but it is not often that we do so; but sometimes it is not a little puzzling in consequence of the probability of there being twins. We must examine the legs very carefully to ascertain this fact. When there are not twins, we must take our choice whether we shall try to get it into a *natural* position, or deliver by the *breech;* and to do either the one or the other, we must first of all ascertain which are *fore* legs, and which are *hind* ones; and this is done by feeling for the projection of the os calcis on the hind leg, but unless care is used this may be mistaken for the pisiform bone at the back of the knee of the fore leg; and having done so, we must fasten different sorts of cords or something around them, so that we shall be able to tell the one from the other; we must now feel for the head, and if we find that we are able to reach it and get it into position, we must secure cords to the fore legs, and get the fœtus away by our assistants pulling at them and the head; whilst we, at the same time, are pushing the hind legs into the abdomen, so as to make room for the passing of the other parts. If we find that the head is out of our reach, and that the hind legs can be secured, we had better proceed to remove by the breech, which we readily can do by pulling at the hind legs, and forcing the fore ones into the abdomen.

Breech presentation.—A breech presentation is that where the tail and hind parts are to be felt projecting towards the os uteri or vagina, and with the fœtus's hind legs stretched out underneath its belly. Sometimes the fœtus lies upon its back, or side, with the breech presented, but most frequently it is in the sitting posture, with its back towards its mother's. This presentation, and the one where the fore legs are presented and the head lying back, I consider to be the most difficult ones that we have to do with. In a case of ordinary breech presentation, and indeed in all others, our first procedure will be to get a quantity of horse, or other solid manure, and make a good well-raised bed preparatory to her lying down, which, most probably, she will soon do, and which would be difficult to place under her when down, and perhaps unable to rise, or stupidly refusing to do so. We must now make a running noose on a cord, and pass it in our hand, or with it on the end of a directing rod —[shown]— over the foot on to the pastern; or we may pass a cord around the leg higher up, and draw it out of the body, and then pass the end of it through a noose, and having done so, we may gradually force the noose so made below the fetlock, and having drawn it pretty tight, we must get our assistant to pull at the cord, whilst we with our hand, or crutch,—[shown,]—force the hind parts forward, by which means we may get the leg into proper position. Sometimes, when we have forced the breech pretty well forward, it will be advisable to leave off pushing against it, and push against the back part of the *hock,* by which means we force the stifle forward, and, in some re-

spects, the breech also, and so make more room for the leg coming up. In some cases, where we cannot bend the leg sufficiently straight at the hock backwards, it will be advisable to get the hock up as far as possible into the passage, and divide the tendon of the flexor metatarsi, previous to its bifurcating, just above and in front of the hock, which will enable us to bend the leg and flex the joint much more than natural. We must also be very careful the foot does not penetrate through the uterus; to avoid which, we must have our hand guarding the foot, whilst with the other, or by an assistant or crutch, the breech is forced well out of the way. Having succeeded in getting the leg well in the passage, we must adopt the same method in getting the other up. Now and then we are not able to get the legs straight into the passage, but have to get the fœtus away by means of cords around the hock or hocks, with one or more of the legs doubled forward against the thigh. In these cases it will be advisable to divide the tendons at the back of the legs, just above the point of the os calcis, and also the flexor tendons below the hocks, by which means the flexion at the hock joints will be more perfect, and the leg and thighs will better approximate. After we have done this, we may pull at the cords around the hocks pretty freely, but we must not omit the forcing of the breech into the abdomen, so as to allow of the limbs at the stifles becoming straightened, and that the stifles shall not stick against the anterior part of the pelvis. In some cases, I have known the fœtus to come away in a breech presentation, without the legs being straightened at the stifles; but it is bad practice, if it can be avoided. In some cases we may remove the leg part, by sawing the bone through close up to the hock, and afterwards passing a cord above the os calcis to pull at, and then pushing the breech forward. In the *Edinburgh Veterinary Review* for May last, I broached the subject of extraction by the breech with one or more of the hind legs lying under its abdomen, or against its flank or flanks; and I must confess I see no reason why the fœtus may not, in some particular cases, be extracted in this position, especially so in those cases where we have one hind leg out to pull at. I perfectly recollect, in one instance, delivering a cow of a very large calf with both of its hind legs under its abdomen, and I never saw a cow after calving do better. After having got the legs straight, we should make an incision into the abdomen and remove its contents, as sometimes the intestines are forced into a heap, causing a complete obstruction to the removal of the other parts. In those cases where we are unable to extract by the breech, through not getting the legs up straight by laying hold of the feet, or when bent at the hocks, we may make pretty free incisions through the skin about the ilio-femoral articulations or rump, and afterwards cut or tear the muscles around these asunder, and then we can secure cords around the iliac processes and coccygeal bones, and hooks against the edge of the obturator foramen, by which means we can remove the pelvic and coccygeal bones; and having done so, we can apply a cord around the heads of the thigh bones and pull them

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All four feet presented—head back.—Occasionally we meet with this presentation, but it is not often that we do so; but sometimes it is not a little puzzling in consequence of the probability of there being twins. We must examine the legs very carefully to ascertain this fact. When there are not twins, we must take our choice whether we shall try to get it into a *natural* position, or deliver by the *breech*; and to do either the one or the other, we must first of all ascertain which are *fore* legs, and which are *hind* ones; and this is done by feeling for the projection of the os calcis on the hind leg, but unless care is used this may be mistaken for the pisiform bone at the back of the knee of the fore leg; and having done so, we must fasten different sorts of cords or something around them, so that we shall be able to tell the one from the other; we must now feel for the head, and if we find that we are able to reach it and get it into position, we must secure cords to the fore legs, and get the fœtus away by our assistants pulling at them and the head; whilst we, at the same time, are pushing the hind legs into the abdomen, so as to make room for the passing of the other parts. If we find that the head is out of our reach, and that the hind legs can be secured, we had better proceed to remove by the breech, which we readily can do by pulling at the hind legs, and forcing the fore ones into the abdomen.

Breech presentation.—A breech presentation is that where the tail and hind parts are to be felt projecting towards the os uteri or vagina, and with the fœtus's hind legs stretched out underneath its belly. Sometimes the fœtus lies upon its back, or side, with the breech presented, but most frequently it is in the sitting posture, with its back towards its mother's. This presentation, and the one where the fore legs are presented and the head lying back, I consider to be the most difficult ones that we have to do with. In a case of ordinary breech presentation, and indeed in all others, our first procedure will be to get a quantity of horse, or other solid manure, and make a good well-raised bed preparatory to her lying down, which, most probably, she will soon do, and which would be difficult to place under her when down, and perhaps unable to rise, or stupidly refusing to do so. We must now make a running noose on a cord, and pass it in our hand, or with it on the end of a directing rod —[shown]— over the foot on to the pastern; or we may pass a cord around the leg higher up, and draw it out of the body, and then pass the end of it through a noose, and having done so, we may gradually force the noose so made below the fetlock, and having drawn it pretty tight, we must get our assistant to pull at the cord, whilst we with our hand, or crutch,—[shown,]—force the hind parts forward, by which means we may get the leg into proper position. Sometimes, when we have forced the breech pretty well forward, it will be advisable to leave off pushing against it, and push against the back part of the hock, by which means we force the stifle forward, and, in some re-

spects, the breech also, and so make more room for the leg coming up. In some cases, where we cannot bend the leg sufficiently straight at the hock backwards, it will be advisable to get the hock up as far as possible into the passage, and divide the tendon of the flexor metatarsi, previous to its bifurcating, just above and in front of the hock, which will enable us to bend the leg and flex the joint much more than natural. We must also be very careful the foot does not penetrate through the uterus; to avoid which, we must have our hand guarding the foot, whilst with the other, or by an assistant or crutch, the breech is forced well out of the way. Having succeeded in getting the leg well in the passage, we must adopt the same method in getting the other up. Now and then we are not able to get the legs straight into the passage, but have to get the fœtus away by means of cords around the hock or hocks, with one or more of the legs doubled forward against the thigh. In these cases it will be advisable to divide the tendons at the back of the legs, just above the point of the os calcis, and also the flexor tendons below the hocks, by which means the flexion at the hock joints will be more perfect, and the leg and thighs will better approximate. After we have done this, we may pull at the cords around the hocks pretty freely, but we must not omit the forcing of the breech into the abdomen, so as to allow of the limbs at the stifles becoming straightened, and that the stifles shall not stick against the anterior part of the pelvis. In some cases, I have known the fœtus to come away in a breech presentation, without the legs being straightened at the stifles; but it is bad practice, if it can be avoided. In some cases we may remove the leg part, by sawing the bone through close up to the hock, and afterwards passing a cord above the os calcis to pull at, and then pushing the breech forward. In the *Edinburgh Veterinary Review* for May last, I broached the subject of extraction by the breech with one or more of the hind legs lying under its abdomen, or against its flank or flanks; and I must confess I see no reason why the fœtus may not, in some particular cases, be extracted in this position, especially so in those cases where we have one hind leg out to pull at. I perfectly recollect, in one instance, delivering a cow of a very large calf with both of its hind legs under its abdomen, and I never saw a cow after calving do better. After having got the legs straight, we should make an incision into the abdomen and remove its contents, as sometimes the intestines are forced into a heap, causing a complete obstruction to the removal of the other parts. In those cases where we are unable to extract by the breech, through not getting the legs up straight by laying hold of the feet, or when bent at the hocks, we may make pretty free incisions through the skin about the ilio-femoral articulations or rump, and afterwards cut or tear the muscles around these asunder, and then we can secure cords around the iliac processes and coccygeal bones, and hooks against the edge of the obturator foramen, by which means we can remove the pelvic and coccygeal bones; and having done so, we can apply a cord around the heads of the thigh bones and pull them

out. We must next make an incision into the abdomen and remove the viscera, as sometimes it is pushed forward and prevents our removing the other parts of the fœtus. Then we must either pass cords around the skin that surrounds the thigh, or insert hooks into the skin, and draw the remainder of the fœtus out with its hind legs under its belly, and so complete extraction. In a case that I shall relate to you shortly, the foal was extracted by pulling at the head and fore feet, with one of the hind legs drawn straight into the passage *under* its body, and the other straight out *behind*,—of course the hind leg that is under the body must be pulled at, at the same time we are pulling at the head and feet.

Breech presentation—one hind leg in horn of uterus.—I was once called in to attend a cow where symptoms of parturition had commenced. It was a breech presentation. The os uteri was but partially dilated, but by gentle manipulations it became tolerably expanded. After a good deal of labour had been expended, we were only enabled to get one of the hind legs up; and for a long time after we could not positively decide whereabouts the other limb was, for we could not find it. At length it was found, and, through great exertion, was brought into its proper position, and the calf extracted. In the course of the day she died. Now what rendered this case so difficult was, that the main bulk of the fœtus lay in the body of the uterus, whilst one of the hind legs lay, at full length, in one of the horns of the uterus, the opening into which was not far distant from the os uteri, as was clearly shown on opening her. It may be observed that all the time my assistant was striving to force the breech back, to make room to get the leg up, he was actually obstructing delivery by impacting the limb. I consider this a very rare and difficult case indeed. In a similar case our best plan would be to try to remove the fœtus by pulling at the breech and the one hind leg, as I before mentioned; or to pass a cord around the hock, and draw it into the vagina as far as possible, and amputate the leg at the hock joint, or dislocate it at the hip-joint, and afterwards get the leg straight.

Cross presentation—all four legs doubled backwards, with bowels only presented.—Now and then—[showing skeleton of one]—we meet with a sort of malformation where the spine is curved backwards, with the whole of the legs lying nearly together over its back. In these cases the intestines are floating loose about, and are the only parts presented. For the removal of the fœtus, we must first of all tear away the intestines, and afterwards divide the spine with a knife or saw,—[shows the saw]—and having done so, we must use our discretion which legs and portion of the body we intend bringing forward into the passage, and then we must push the other parts back into the abdomen, by which means we shall easily remove the whole of the fœtus. In some cases I have been able to get either the hind legs, or the head and fore legs, into the passage without dividing the spine, and, on our pulling at the fœtus, the spine has given way and become dislocated, which enabled us to remove the fœtus with little difficulty.

Cross birth—back presenting.—What is called a cross birth, is where the back of the fœtus is presented, without the head or any of the legs making their appearance. I am inclined to think that this does not often occur, as I have met with but very few such in my practice; but whenever it does, we must ascertain whether the head and fore legs, or the hind parts and extremities, can be laid hold of best, so as to extract the fœtus with the least danger to the mother. Whichever way we may decide upon, we must fasten cords to the feet, &c., for our assistants to pull at, whilst we turn and force back the opposite extremities with one or both hands, and then extract as in ordinary cases.

It was stated in *Bell's Life*, April 2, 1843, that the celebrated mare, the Queen of Trumps, the property of the Hon. E. M. L. Mostyn, and winner of the Oaks and St Leger, died at York on the previous 28th of March, in giving birth to a filly foal, in consequence of there being a cross birth; and it was *said* that no human aid could have saved her.

Body curved—head and one fore leg, and two hind legs presented.—In a previous case we had a similar curvature of the spine, as in the present instance, but in that case we had the bowels presented; but here—[shows the specimen]—we have the head and *three* legs presented, with the intestines floating loose within the abdomen behind the body. Now in such cases as these we must secure cords to the *hind* legs above the fetlocks or hocks, or both, and then leave our assistants to pull at them so as to get them into the passage, whilst we push back the head and fore leg out of the way. On pushing the head or fore leg back, we may sometimes find that the *other* fore leg may not be far off, which will require pushing back also. If we could get the other fore leg up, of course our best plan would be to deliver by the head and fore feet, and push the hind ones in. By this procedure we shall generally find that we have dislocated or fractured the spine. As the head and legs, in such cases, are very much in our way, we may find some difficulty in *sawing* the spine through; but I certainly should advise in every case, when possible, that we should divide the spine with a knife or saw, so as to avoid injuring the poor animal in drawing the calf away. In some of these cases—[as shown]—the ribs are often displaced, and the legs bent into various unnatural shapes.

Breech presentation — muscles, &c., of the hind legs contracted.—I once met with a case of breech presentation where the stifles lay in the flanks, and nearly close to the posterior ribs, and were firmly held there by the contractions of the skin from the stifles to the body. The hocks lay, on the contrary, just under the hip joints, and were firmly held there by similar contractions. The legs, from the hocks downward, lay slopingly under the hind parts, and which we were enabled to get straight into the passage; but the *whole* limbs, on account of their being so firmly contracted to the body at the stifles, could not be brought straight. In trying to get first one limb and

then the other straight, we secured cords about the hocks, but we found, on pulling at them, that the limbs separated between the metatarsal bones and the hocks. We then secured cords just above the os calcis and pulled the fœtus away, with the hind legs doubled up in this position. She died in twelve hours after, and the uterus was found to be ruptured. Of course, had we positively known of these contractions, (although I suspected something of the sort,) *we must* have *tried* to separate them.

Head and fore feet presented—half extraction—hind legs in pelvis.—I once met with the following curious case. A cow showed symptoms of calving, and soon after the fore feet appeared, and not long after the head was seen. A variety of assistance had been called in previous to my arrival, but, with all their cleverness and strength, they could not get the calf away further than the loins. I was then sent for, and found my patient in a sad exhausted state, with one half of the fœtus hanging out. I made an examination, when I soon found that the hind legs of the calf were also in the pelvis, thus preventing us, with all the strength we could muster, drawing the fœtus away, as the hind parts, together with the metatarsal and tibial bones, were doubled up, and thus completely wedging the passage up, as every time she strained she forced the hind feet into the passage. Of course, in trying to pull it away in this position, the femoral bones would be thrown straight up before the hind parts could pass. I now secured cords to the hind legs, and then removed the thoracic and abdominal viscera, and the whole of the body that was protruded, and then forced back the loins, whilst my assistants drew at the hind legs and extracted the remainder of the body without any further difficulty. We gave her some stimulants, but she died soon after. I found the uterus ruptured at its neck, where it is generally found to be so.

There is a similar case recorded in the second volume of the *Edinburgh Veterinary Review,* but in this case only THE LEFT HIND LEG lay in the pelvis, whilst the right one lay *straight out behind.* In this case the abdominal viscera were removed, and then the leg lying in the pelvis was drawn forward, whilst others were pulling at the head and fore legs.

Head and fore legs presented—one hind leg across in front of the fore legs.—This is a very unusual position. To extract the fœtus we must put cords on the fore legs, and afterwards force the head and fœtus back into the abdomen, and then push the hind leg from across the fore ones back into the abdomen; then get the head and fore feet into position. But if we cannot do this we must draw the hind leg out and amputate it at the hock, or as high up as possible, and then push the remainder of the leg back out of our way.

Twins—head and six legs.—As I think we have plenty of matter for this evening's discussion, I will not enter upon the subject of extracting twins, but will refer you to a paper of mine, which you will find in vol. xix. of the *Veterinarian,* p. 19, which you can read at your leisure, or when necessary.

Large head.—It is a well-authenticated fact, that some males, of every animal, will get stock with very large heads; and Price, in his work on sheep, mentions that a grazier in Appledore employed Leicester rams for several years, and obtained a breed with very small heads and kindly disposition; but he objected that they were not large enough, and did not fetch a good price in the market; he therefore, in the summer of 1804, hired some large Kentish rams to give size.

In the following lambing season he lost twelve ewes from the largeness of the lambs' heads, and he was obliged to "draw" almost all his ewe lambs. In 1806 he had the same difficulty, and lost nine ewes out of 250 from this cause. I have frequently known that some bulls get calves with very large heads, and causing great difficulty in calving; and the owners, finding what trouble there was at calving time and the danger in losing their cows, have sold them, and obtained others whose breed had not this objection. But the cases which I wish more especially to call your attention to are those extraordinary ones produced by *hydrocephalus*, an instance of which I have recently had in a cow. It was a breech presentation, and from extracting in this position, the vagina, no doubt, had become very much dilated, which enabled us to remove the head without much difficulty. At home I have a monstrosity of a pig that was brought forth by a sow without any assistance rendered her. It had two divergent distinct noses and faces, united by one skull, with four eyes, four legs, and a body, and measured 4½ inches from the outside of one snout to the other. It was, no doubt, a breech presentation.

Method of extraction.—We may, first of all, try to force the legs into the uterus, (if a cow,) and then draw the head within reach, and puncture it with a trochar or perforator; and having done so, we can bring the feet up, and deliver in the ordinary way, when we shall generally find that the head will probably collapse and pass through, or we may remove the fore legs, and then pass a cord around the neck, or insert hooks into the orbits, palate, or under the ligamentum nuchæ, or a cord around the lower jaw and skin, or forceps into the nostrils; and having done some of these things, we must wait until pains come on, when we must use all prudential force, and most likely we shall succeed; but if we find that we cannot remove it without doing injury, we must make incisions on the skin of the head, and remove portions of the skull piecemeal with the saw, hooks, or forceps; and sometimes, having partially done so, the skull will, in some degree, be compressed, and we shall be enabled to extract it. As I stated before, in most instances, when they are breech presentations, the head will come away more easily on account of the passage having been dilated from the other parts having passed through.

Leg-hanked. Twins—one a breech presentation; the other with its four legs presented.—In 1843, I had a communication from Mr Cox, veterinary surgeon, of Ashbourne, wherein he mentioned the following rare case:—The cow having made no progress in parturition, he ex-

amined her, and found the tail and breech of one, and all the feet of the other calf presented. He corded the hind feet of the latter, and pulled at them, at the same time pushing the head and fore legs back; but from one of the hind legs not properly advancing, he made a further examination, when he found that it had shot between the hind legs of the other calf, constituting what is called by some "leg-hanked." The end of the hind leg that did not sufficiently advance was then loosed, and, by pulling at the other leg, it caused the fast one to come from between the hind legs of the other calf; after which it was again corded and brought up, and the calf was readily extracted.

Breech presentation—malformed calf.—Once I was called in to a cow that was unwell after calving. It had been a breech presentation, and with great difficulty they had got the calf away in this position. The uterus was ruptured, and I had the animal destroyed. On examining the extracted calf, I found that the hind parts of it were much contracted, and diminished in size. The anus was impervious. The os femoris, on the near side, just below the cervix, and the tibia on the left side, were fractured in extracting the calf.

Each of the hind extremities, before they were fractured, must have been lying under the belly or against the sides; and from their having been in this posture, the ligaments of the anterior parts of her stifles had become shortened and contracted, and the femur and tibia formed almost a straight line, there not being the least flexion at the stifle joints; but the stifle, hock, fetlock, and pastern joints were so firmly braced together that each was completely fixed and immovable, and would not bend backwards, sideways, or forward in the least. On examining these joints, there did not seem to be the least union of the cartilages or bones, but only a shortening of the ligaments. From the contractions at the stifle joints, the legs were almost straight. In extracting this calf he must have known that there was something wrong from the fetlock joints not bending, and the other joints not giving way. No doubt, the operator must have had great difficulty in removing the calf. Had he known what state the calf was in, especially as the hind parts were diminished in size, the best plan would have been to have passed cords around between the stifles and the body, and tried to have extracted it in this position, or removed the pelvic bones in the way mentioned before.

Head and one fore leg presented—band or septum in the vagina.—Now and then we meet with cases where there are bands stretching across the vagina, and of course obstructing parturition. A case of this sort I once met with in a *mare.* I was not with her foaling, but the person that assisted her said that she had gone her full period of utero-gestation; and that, when he saw her, the head and one fore foot was only presented. She was straining violently, and had forced down nearly half a yard of the rectum. The gut could not be returned. He found the other fore leg projecting over its *neck,* and forcing against the mare's rectum. By pushing the foal *back,* he got this leg also into its proper place, and extracted a small

foal with little difficulty. The rectum was then forced back. After she had foaled, I was called in to attend her, as she was very ill, and getting up, and lying down, and rolling about most of the night; but she died in thirty-six hours after. On examination I found that the mesentery of the rectum was torn away from it at least half a yard in extent. On laying open the vagina and uterus, I found in the former a strong band, the thickness of one's little finger, and about a foot long, stretching across, at about six inches from the os uteri, from one side to the other. I have no doubt that at the time of parturition the fore leg of the foal, that was not presented, was retained by this band that was stretched across the vagina, and prevented her from foaling, and was the cause of the mesentery being ruptured.

SECOND SIMILAR CASE.—*Ligature forming a septum in the vagina of a cow, producing retention of the fœtus.*—I was once called in to a cow that was not well. Her owner informed me that she ought to have calved some months before, and at that time she showed every symptom of approaching parturition, but she did not calve, but continued after that to pass a good deal of offensive matter from the vagina. On "touching" her for the calf, I could evidently feel some lifeless tumour, and on passing my hand up the rectum, I could not feel anything like a *live* calf. I next examined the vagina, to ascertain if there was any dilatation of the os uteri, but I could not detect the least; but I was very much surprised to find that there was a ligamentary band close to the os uteri, extending from the upper to the lower side of the vagina, of the thickness of a penny cord. It was quite firm in its texture, and on pulling at it, I drew the vagina back and the band in sight, so that the bystanders could see it; I divided it. At this time she had the pleuro-pneumonia, and she was killed. After her death I had the opportunity of examining the vagina. I think there can be no doubt but what this band prevented her from calving, and it would, I imagine, have the power of preventing the os uteri from dilating, even when pressure was applied by the contraction of the uterus.

THIRD CASE—*Parturition in a sow—non-extraction*—SEPTUM IN THE VAGINA.—Some twenty years ago I was called in to a sow that could not pig her whole "litter." She had pigged several when I saw her, and was continually straining. On examining her I could just feel the nose of another pig, but with all her straining she could not void it. I then put a small hook through the lower jaw, but it soon broke out. I next put it into the upper jaw, eye-holes, &c., but in every place it tore out. At length I pulled away the ends of the upper and lower jaw with my fingers; and afterwards I got my finger into one of the eyeholes, and in pulling at it, a part of the bones of the face came away. During this time she was under the effect of the ergot of rye. From this time the vagina became more swollen, and as we could not attach anything more to the head, and she being excessively fat, I advised her to be killed for meat. On making a *post mortem* examination, I found that at about five inches

from the mouth of the vagina, there were two distinct passages, but that on the right hand was the largest. This division appeared to be formed by a strong band, composed, to all appearance, of muscular fibre, and covered with the mucus membrane as in other places, and was attached to the upper and lower part of the vagina, but inclining a little more to one side. This attachment was about three inches long, but extended in a loose way from it, on both sides, for two inches more, thus dividing the vagina for about seven inches into two distinct cavities. The vagina was about twelve inches long even beyond this division. No doubt the pigs she had passed had come through the largest passage, and that which we could not remove had became impacted in the smaller one.

FOURTH CASE—*Band across the os uteri.*—In the second volume of the *Edinburgh Veterinary Review*, p. 282, there is a foreign case by Vincenzo Luatti, of a cow that had been in labour for two days. He found, on examination, there was a complete prolapsus of the vagina, and, on further examination, he found that the os uteri was closed by a fleshy band which was attached to the superior and inferior border, but which was laterally free. He divided it, and removed the two portions, and reduced the prolapsus, and in a week after she gave birth after an easy labour. Now this case might have been very obscure had not the prolapsus existed.

Lying on its back, with poll presented, and four feet over belly.—In the human subject great stress is properly laid on having the head and other parts in a proper position, so as for the fœtus to pass through the pelvis with the greatest ease; and there is not the least doubt but that we should attend to this principle as much as possible in our patients. I have not yet sufficiently attended to the measurement of the pelvis in various animals, but Rainard, Gunther, and Baumeister, and others on the continent, have done so, and it is a great pity their works on veterinary obstetricy have not been translated.

In these cases we must first of all cord the lower jaw, and afterwards force the head out of our way, and then cord the fore legs. We must then get the head and legs straight into the passage, and get our assistants to lay hold of the fore legs, and try to *writhe* the fœtus completely over into a natural position, whilst we assist him by pushing against the shoulder and sometimes at the head, but in a great many instances this "turning" is sooner said than done. If we succeed, all well, but if not, when we have fairly got the head and legs straight, we must attempt to get the fœtus away lying on its back, and we shall generally find that it will come away nearly as easy as when put into a natural position; but in pulling at the legs and head we must, for a time, draw them more upwards towards the tail of the mother.

In some of these presentations, if we cannot otherwise succeed, and when we have secured the hind legs, it will be quite as well to deliver by the breech, by pushing the head and fore parts back, having previously removed the abdominal viscera.

Sometimes the head is doubled backwards under its neck, or against its side; and to mend the matter, not unfrequently the fœtus is found to be dead, and has been so for some time, and lying low down a lifeless, inert mass. In these cases, to make room, we must remove the fore legs, when most probably we shall get the head up.

On back, hind feet presented.—In some cases of breech presentations, when the calf is lying on its back, the hind legs are not in the passage but are lying on its belly. In such cases we must get hold of the hind legs and pull them straight; and having done so, we must try to remove the fœtus in this position, and shall sometimes succeed; but if we do not, we must remove the hind legs at the hips, and having secured the fore feet, we must push the hind parts in and get hold of the head, and deliver as in a natural way.

Dropsy of the abdomen — enlarged fœtal bladder.—Professor Simonds mentions a case of protracted labour from dropsy of the abdomen, and recommends a long trochar to be passed through the thorax into the abdomen. Such a cause certainly may sometimes exist, but I fancy it must be very rare, as I never met with a case yet. If we should, we may, as he recommends, pass a trochar into it through the chest, or we may puncture the abdomen with a knife.

He has also recorded in the "Veterinary Transactions" a *very unusual* case indeed, in the mare, of distension of the abdomen, produced by an enlarged bladder in the fœtus, from congenital closure of the urachus, and this case was the cause of his subsequent use of the long trochar in enlarged bellies.

In conclusion, Mr President, I may just observe that I am perfectly aware that there are various other presentations, malformations, and important matter connected with parturition that, if honoured, I may, at some future day, bring forward before the Association. I now return you my sincere thanks for the very great patience you have displayed in listening to my rather long essay.

[A great variety of hooks, knives, Nelson's and other forceps, saws, and parturition instruments were shown, and illustrated the lecture.]

persons reckless enough to buy them, carrying the disease along with them, and poisoning the roads and fields wherever they might be taken. The present state of matters, caused by the introduction of the plague into the country, is unprecedented, and strong means must be used in order to meet the increasing difficulties of the case. There was too much supineness manifested at first, too great a tendency to shut our eyes not only to the actual existence of the disease, but also to its exceedingly dangerous nature, and the effects of the error which was then committed can only be met by extreme measures. Such have already been adopted with reference to certain channels, through which, it was believed, the plague might be carried into healthy districts, and a temporary suspension of the store cattle markets and fairs would certainly not be more arbitrary than other steps which have already been taken, and for which the authorities have received the highest praise. No doubt the measure would be attended with some inconvenience, and even loss to individuals; but the public welfare is deeply concerned in it, and individual interests must always give way to considerations designed to promote the good of the community at large. The magistrates of Brechin have shown a good example by recommending that Trinity Muir Market should not be held; and it remains with the authorities elsewhere not only to follow their example, but to go farther, and positively prohibit store cattle fairs until all danger shall have passed.

PERISCOPE.

MEDICAL REPORT OF THE THIRTY-FIFTH MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE Physiological Section mustered this year under the Presidency of Dr Acland, Regius Professor of the University of Oxford, true scholar and gentleman. No selection of president could have been happier. He was supported by,—*Vice-Presidents:* John Davy, M.D., F.R.S; Professor Rolleston, F.R.S.; Professor Lionel Beale, F.R.S.; Professor Van Der Hoeven; Edward Smith, M.D., F.R.S., LL.D.; Professor John Hughes Bennett, M.D., F.R.S.E. *Secretaries:* William Turner, M.B., F.R.S.E.; Alexander Fleming, M.D.; Thomas P. Heslop, M.D.; Oliver Pemberton. *Committee:* J. Balding Barkway; F. T. Bond, M.D.; Charles Brooke, F.R.S.; Frank Chance, M.D.; T. S. Cobbold, M.D., F.R.S., F.L.S.; T. A. Carter, M.D.; Dr Gilbert Child; Robert Dunn; M. Foster, M.D.; R. Garner, F.L.S.; George D. Gibb, M.D., F.G.S., LL.D.; Arthur Gamgee, M.D.; J. Deaken Heaton, M.D.; William Hinds, M.D.; R. P. Howard, M.D.; W. R. Hughes, F.L.S.; G. M. Humphry, M.D., F.R.S.; Furneaux T. Jordan; W. H. Kelburne King, M.D.; W. H. Lightbody, M.D.; Professor Macdonald; J. R. Milner; Professor Parkes, F.R.S.; Henry Power, M.B.; Dr Ransom; B. W. Richardson, M.A., M.D.; and Edward Waters, M.D. We also observed present Dr Crisp, Mr J. S. Gamgee, Dr Arlidge, Mr E. Watkin Williams, Dr T. Wood, Professor Wanklyn, and others well known in medicine and general science.

Of the work of the Section this year we shall be able to form a more correct estimate when it is fairly before us. Let us, then, at once to the work, commencing with—

THE PRESIDENT'S ADDRESS.

By Henry W. Acland, M.D., LL.D., F.R.S.

LADIES AND GENTLEMEN,—In addressing you from the chair this day, I desire first of all to express my sense of the unmerited honour thus conferred upon me. When informed that it was intended to propose me as your chairman, my first impulse was without hesitation to decline so great a distinction, in order that the post might be held by one of the many eminent persons who usually contribute to the success of the Section, or to the renown of the Department. Further consideration seemed to show me that the greater homage would be to place unreservedly at your service such humble powers as I have, and to offer you that which I possess, viz., the force of profound interest in the progress of one of the most important departments of human knowledge, and of sympathy all but lifelong with its promoters.

I rely, therefore, on the support which you will generously give to my endeavours to secure all full and fair discussion that is consistent with a due regard to the limited time at our disposal.

It has become a custom that the Presidents of Sections should make some opening address, though it is held to be inexpedient that it should be elaborate or long. While debating on the subjects on which I might usefully touch, I chanced to encounter the remark of a philosophic writer, that the time was come when it was a prime necessity for biology that it should be separated from medicine. The grounds alleged were, the imperfect education of physicians, their want of leisure, and the magnitude of biological science. There seemed to me such a mixture of truth and error in the remark itself, and in the general tenor of the data on which it was founded, that it appeared to me well worthy of your attention.

As to the imperfect education of physicians, the remark is too general to be correct, and is not a topic proper to be considered here, further than to say, first, that it is to great medical minds, from Hippocrates and Galen down to Haller and Hunter, that we owe the promotion, and, indeed, the very creation, of a large part of existing biological knowledge, so that these men cannot have been ill furnished for their work; and, secondly, that it is certain that no persons who are not well prepared will in future make any additions of importance to this or any other department of science. The observation, therefore, on the whole, amounts to this, that in these days biological science has become too expensive to be committed to the care of any but those who can give to it undivided attention. This also is only true under limitation. It is true so far as this, that division of labour is as necessary for the perfection of this

The Veterinary Review and Stockowners' Journal.

THE CATTLE PLAGUE.

THE readers of this Journal are too well acquainted with the manner in which a national disease-preventive system has been advocated, not to be aware that the calamity which has befallen this country was long since predicted, and strenuous efforts have been made to induce the Government and the agricultural public to be armed for the worst. The result of inattention to oft-repeated warnings has been the introduction of the fatal rinderpest, by a herd of Russian cattle brought into this country at the end of last May. It is singular that this most fatal epizootic should not have been speedily recognised and checked in its progress in the city of London; but the fact is, that so late as the 24th of July the Government referred to the outbreak as of an uncertain nature, and strange to say that the editors of the *Veterinarian* only spoke of it as a fatal bovine disease, without enlightening the world as to its character. Delay in all such cases is most dangerous; and having heard of the outbreak so late as the 29th of July, we instantly took steps to warn the country of its danger, though it was too late for any notice in this Journal. The disease has progressed rapidly; its inroads in this country must be attributed not a little to the difficulty we have in getting proper measures carried out. We are always late in doing things well in Britain, and we must expect to suffer in consequence. Partial means are of no use with the most malignant, the most contagious, and destructive plague known as affecting any living thing on the face of the globe. The usual injunctions as to cleanliness, ventilation, &c. &c., have been repeated, but the right thing has yet to be done. Until Government establishes an insurance fund, until it gets control of the animals and herds affected, and until no efforts are spared to do away with any and every condition whereby the disease may be propagated, the malady must spread. It has not yet reached its *acme*. Farmers are now beginning to buy for winter feeding, and

with an increased number of purchases, we must have an increased number of outbreaks. The cold weather will smother the poison; moisture will preserve and disseminate it, whilst cold will check its production. During hot weather discharges dry or putrify, and large quantities are thus rendered inert; the reverse is witnessed in winter, and unless the authorities are on the alert, we shall hear more of the cattle plague in the spring of 1866 than we have yet.

It is our belief that, under such an affliction, the interests of the country can only be served by assembling Parliament, and dealing at once and energetically with the whole question. Let us not have more delays, and, instead of abusing the veterinary profession in the way in which some editors of public journals have done, let us have the rules which veterinary surgeons can frame for the prevention of the disease strictly carried out. It is erroneously supposed we are in ignorance as to the nature and treatment for prevention of the disease. There are subjects on which information is far too scanty; but on the history of the steppe murrain, and the methods of dealing with it, our knowledge is ample and exhaustive. The eyes of the world are now turned to the members of our profession, and all we can say to them is, that every man must do his duty.

THE ALBERT VETERINARY COLLEGE.

Our readers will notice that the Inaugural Address at this Institution is to be delivered in the College on the 2d of October. More will be said on this subject in our next impression.

THE PLAGUE AND APPROACHING GREAT CATTLE FAIRS.

(From the Scottish Farmer.)

Mr JOHN HUDSON, of the Metropolitan Cattle Market, has suggested, through the medium of the *Times*, that all cattle throughout the whole kingdom, except those intended for immediate slaughter, shall be placed in quarantine for a limited period, say one month; that all store cattle markets and fairs be suspended for the same period, and that all store cattle be kept on the same farms where they are now grazing. Mr Hudson also suggests the propriety of putting an entire stop to the sending of beasts from London to the country, whether intended for immediate slaughter, for grazing, or other purposes. He considers that the quarantine system would enable inspectors to detect cases more readily than it is possible to do at present, and that the temporary suspension of business in the country markets would tend materially to purify them.

It will be observed that Mr Hudson's suggestion, with reference to the suspension of store cattle markets and fairs, is substantially the same as that made by Mr Swan at the meeting of the Edinburgh Dairymen's Mutual Protection Association, held on Wednesday last, and the subject is altogether of too important a nature to be dismissed in a mere paragragh. The period is rapidly approaching when some of the largest fairs in the kingdom will be held, such as Falkirk Tryst, All-Hallow Fair, &c., and there is every probability that the plague will become more widely diffused than it is at present through the medium of those fairs. The cattle brought to the September Tryst were no doubt subjected to separate examination, and reported healthy; but it must be borne in mind that the supply of cattle at the September Tryst is very small compared with that which is brought out for the October fair, and therefore much more easily examined. In fact, we consider a proper examination of cattle at the October Tryst impossible; and it would appear that the inspection of stock even at the last Tryst was ineffective, as we find it stated that the plague has broken out on a farm near Saline, in the west of Fifeshire, among a lot of beasts which had been purchased at the September Tryst. Nor is this a solitary case. Cattle purchased at the *last* Tryst have carried the plague, it appears, into Perthshire and

Forfarshire, and we may expect every day to hear of outbreaks in fresh districts from the same cause.

If the supply of beasts at the October Tryst came direct from and through healthy districts, there would be the less need for extreme measures; but this is not the case, and with a large number of beasts from Ireland, there will be also cattle in considerable numbers from places where the plague is notoriously prevalent and fatal. Until now, Irish cattle were reported as being perfectly free from this justly dreaded disease, although the best veterinary authorities in that part of the kingdom agreed in representing pleuro-pneumonia and mouth-and-foot disease to have been more than usually prevalent. It is now stated that the plague not only exists in one district in the north of Ireland, but that it has actually existed there for at least a month, carrying off some thirty or forty animals. The existence of the plague in the district where it is stated to have appeared, is of course denied, and it is not necessary that we should argue the matter at present. We shall give the north of Ireland cattle-owners the benefit of the doubt, but this does not suffice to prove that the Irish cattle shown at Falkirk will be free from disease. The cattle from Ireland are landed at Glasgow, where the plague has been very fatal; they may be put into fields near the town, or into trucks, where the seeds of the plague may be taken up by them; they may even travel on a road which has become infected, and no matter how healthy they were when they left Ireland, still it is by no means improbable that they will come upon Stenhouse Muir with the germs of the plague in their system, simply in consequence of having passed, as they must do, through infected places. It is among Irish cattle, bought at Falkirk, that the plague has broken out at Blair-Drummond and Coupar-Angus. There will no doubt be cattle also on the ground direct from Glasgow and Edinburgh, healthy enough, perhaps, to pass an inspector, but nevertheless thoroughly dangerous; and altogether it is a matter of imperative necessity that immediate steps be taken to prevent any further spread of the plague through the medium of beasts which have been exposed to contagion, and have stood in a public fair.

There are some, perhaps, who may consider a step such as that which has been proposed too arbitrary to be undertaken by the authorities, or even submitted to by the public. It may be argued that people can refrain from going to the fairs with the view of purchasing cattle; but merely declining to buy will not amend matters. The unsold stock would be driven on through the country in quest of

persons reckless enough to buy them, carrying the disease along with them, and poisoning the roads and fields wherever they might be taken. The present state of matters, caused by the introduction of the plague into the country, is unprecedented, and strong means must be used in order to meet the increasing difficulties of the case. There was too much supineness manifested at first, too great a tendency to shut our eyes not only to the actual existence of the disease, but also to its exceedingly dangerous nature, and the effects of the error which was then committed can only be met by extreme measures. Such have already been adopted with reference to certain channels, through which, it was believed, the plague might be carried into healthy districts, and a temporary suspension of the store cattle markets and fairs would certainly not be more arbitrary than other steps which have already been taken, and for which the authorities have received the highest praise. No doubt the measure would be attended with some inconvenience, and even loss to individuals; but the public welfare is deeply concerned in it, and individual interests must always give way to considerations designed to promote the good of the community at large. The magistrates of Brechin have shown a good example by recommending that Trinity Muir Market should not be held; and it remains with the authorities elsewhere not only to follow their example, but to go farther, and positively prohibit store cattle fairs until all danger shall have passed.

PERISCOPE.

MEDICAL REPORT OF THE THIRTY-FIFTH MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE Physiological Section mustered this year under the Presidency of Dr Acland, Regius Professor of the University of Oxford, true scholar and gentleman. No selection of president could have been happier. He was supported by,—*Vice-Presidents:* John Davy, M.D., F.R.S; Professor Rolleston, F.R.S.; Professor Lionel Beale, F.R.S.; Professor Van Der Hoeven; Edward Smith, M.D., F.R.S., LL.D.; Professor John Hughes Bennett, M.D., F.R.S.E. *Secretaries:* William Turner, M.B., F.R.S.E.; Alexander Fleming, M.D.; Thomas P. Heslop, M.D.; Oliver Pemberton. *Committee:* J. Balding Barkway; F. T. Bond, M.D.; Charles Brooke, F.R.S.; Frank Chance, M.D.; T. S. Cobbold, M.D., F.R.S., F.L.S.; T. A. Carter, M.D.; Dr Gilbert Child; Robert Dunn; M. Foster, M.D.; R. Garner, F.L.S.; George D. Gibb, M.D., F.G.S., LL.D.; Arthur Gamgee, M.D.; J. Deaken Heaton, M.D.; William Hinds, M.D.; R. P. Howard, M.D.; W. R. Hughes, F.L.S.; G. M. Humphry, M.D., F.R.S.; Furneaux T. Jordan; W. H. Kelburne King, M.D.; W. H. Lightbody, M.D.; Professor Macdonald; J. R. Milner; Professor Parkes, F.R.S.; Henry Power, M.B.; Dr Ransom; B. W. Richardson, M.A., M.D.; and Edward Waters, M.D. We also observed present Dr Crisp, Mr J. S. Gamgee, Dr Arlidge, Mr E. Watkin Williams, Dr T. Wood, Professor Wanklyn, and others well known in medicine and general science.

Of the work of the Section this year we shall be able to form a more correct estimate when it is fairly before us. Let us, then, at once to the work, commencing with—

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As to the imperfect education of physicians, the remark is too general to be correct, and is not a topic proper to be considered here, further than to say, first, that it is to great medical minds, from Hippocrates and Galen down to Haller and Hunter, that we owe the promotion, and, indeed, the very creation, of a large part of existing biological knowledge, so that these men cannot have been ill furnished for their work; and, secondly, that it is certain that no persons who are not well prepared will in future make any additions of importance to this or any other department of science. The observation, therefore, on the whole, amounts to this, that in these days biological science has become too expensive to be committed to the care of any but those who can give to it undivided attention. This also is only true under limitation. It is true so far as this, that division of labour is as necessary for the perfection of this

portion of science as of others; and further, that some parts of biology are become so complicated and so extensive as to demand for original work the whole powers of any man of ordinary calibre. But it would be quite as just if we were to lay it down broadly, "There has been no period when it was as necessary for the progress of biology as now it is, that its relations with medicine should be closely maintained." Neither position would be wholly true, or, therefore, wholly safe. It may not be amiss to occupy a short time at the outset of our detailed labours with a brief consideration of the real scope of the pursuit in which we are engaged, and of the means which we possess for attaining our objects. I crave your indulgence if my analytical description fall short of your distinct conceptions or your more sanguine aspirations.

The objects of biological study are, unquestionably, as in most other sciences,—First, simply to ascertain what are the facts in a certain department of nature, with no regard to the practical consequences which can be deducible therefrom; and, secondly, but less directly, to discover the laws and devise the rules which are of various degrees of importance and value for the practical exigencies of mankind,—just as mathematical and physical astronomers investigate the facts which are necessary for the construction of the ephemeris, and make it to be a work of equal value for the pure astronomer and for the practical navigator.

But some of the facts which physiology investigates, and the laws which it seeks to discover, happen to be of cogent consequence to all men equally,—to the thoughtful and the cultivated, because they have the tendency to illuminate the most hidden recesses of our mental constitutions, the most obscure traces of our origin, and our various correlations to other beings, animate and inanimate; to the mere "hewers of wood and drawers of water" among men, because it seeks to ascertain in the most precise manner the conditions of physical existence, to point out the work that can, and that cannot be done upon such and such an amount of sustenance. In short, it seeks to define the exigencies of the human body in respect of all the external circumstances in which it is ordinarily placed, in respect also of all other physical agents that can act upon, or be acted upon, by it; together with the internal chemical and physical alterations to which these several circumstances can, directly or indirectly, give rise. It has to learn also the limits of toleration within which the body is confined by these external agents, and the way in which these limits are regulated—as the laws of toleration, of climate, of heat, of food, of various noxious agents, and many other particulars, of which the catalogue would be greater than that of the ships of Homer.

Every person, therefore, whether he knows it or not—the statesman, who has to consider the sustentation of the people—the religious man (that is, every one who believes in a moral government of the world, or hopes for a future state, and who has opinions on the history or origin of the human race)—the animal man, who prides himself on his strength, or whose strength is to him for a fortune—the mother, rich or poor, who yearns by night and by day for the healthy growth of her tender offspring—the physician or philanthropist, who desires to avert or to relieve diseases among communities or individuals of men—each and all of these are alike really interested in the steady progress of the most abstruse philosophical speculations of the physiologist, as certainly as of the commoner rules of a healthy life, which are to be safely deduced from them.

In reference, therefore, to the opinion which was just now adverted to, I think that biology is to be extricated from the hands of physicians only in a limited sense. No persons have so many grounds for advancing it as they. The physician, abstractedly considered, combines all the characters to which I have alluded. He is, in respect of the health of the people, a statesman; as a man, like others, a religious man; not less than others, father and husband; as much as any, a working-man; by education, more or less, a man of science. In short, abstractedly considered, I say it is his special duty at least to advocate and, if he can, to promote the advance of physiological knowledge unfettered and free,—

1st. As a pure science.

2d. As the basis of the medical art.

3d. As of practical utility in helping to regulate the lives and habits of society at large.

Now the hindrances to a perfectly free study of physiological science arise from two causes:—

1st. The intrinsic difficulty of the subject; and, 2d., The prejudices of mankind.

To the consideration of these two points it may not be useless for us to devote some attention.

1st. As to the intrinsic difficulty of the subject.

Although the wisdom of this Association entitles this meeting a sub-section, I am among the minority who cannot understand the force of the arguments which go to class biology (which term may be now used synonymously with physiology) as a subordinate subject. Being, when properly considered, the most complicated of all the subject-matter debated at this Association, it cannot be really subordinate to any, least of all to zoology and botany, which it distinctly includes. It may be an open question whether physiology be a branch of physics and chemistry; it is not an open question whether it includes the knowledge of the characteristics upon which the classification of all entities that are said to have life is based.

It were an impertinence, however, now to spend time in arguing about the classification of sciences. It is sufficient for us to note the vast range of biology, a range which every year makes more wide.

The knowledge of the actions of living beings depends, and necessarily depends, not only upon what may be learned intrinsically, so to say, in the living beings themselves, but upon the collateral advancing waves of physical and chemical inquiry. How largely, for instance, in the last few years, have the idea of conservation of force in physics, and the remarkable advance of the synthetical operations of the laboratory, affected our fundamental conceptions of the actions in living bodies, and increased the chances of our advancing a step towards the knowledge of what is essential in the phenomena which we designate life!

The intrinsic difficulty of this search in the present day consists not so much in the morphological examination of beings on the one hand as complex as man, with all his varieties, and the problems thereto attaching (though this morphological examination of man in all his varieties is still incomplete,) nor in the examination, on the other hand, of beings so inexplicably simple as our own *Amœba*, or as the ancient (and how ancient!) *Eozôon Canadense*, but in the causes and conditions of the actual or potential changes in the minutest portions of any one creature. The labours of Goodsir and Virchow and Beale, and of many others labouring in the same direction and in various ways, have shown, what was indeed long suspected, that the solution of the problem of the actual relation between function and organ may be sought, and has to be sought, among parts mechanically almost as fine as the chemical atom; for we have life, secretion, motion, generation in parts, to our present means of examination, structureless. Yet, although this may be the case, it would be a great error to suppose that there is not much work yet to be done in the more obvious department of descriptive anatomy which chiefly occupied older investigators. Every year seems to show this, from the researches of cultivated palæontologists and naturalists in every department: for both in this country and on the two continents, additions are being unceasingly made to the stock of knowledge either of objects wholly new, or of objects or parts heretofore incompletely described.

For the purposes of the great scientific question of this age, the causes of the present order of life on the globe, it would seem that the minutest accepted data of biological conclusion may have to be revised under new methods. It is a saying among painters, "that a draughtsman *sees* no more than he *knows*." It is true in the same way in natural science, that the real signification of a known fact may be concealed for ages. Of this, pathology offers many examples. The older naturalists, notwithstanding the great learning of such men as Linnæus and Haller, had comparatively either very simple or hypothetical and incorrect notions of the complexities of living beings and their constituent parts. Chemistry, the microscope, and the search for the origin of species, have, in this country, widened the horizon of biological study in a way not less surprising than does the dawn of day to a traveller, who, having by night ascended some lofty peak, sees gradually unfolding an extent and detail of prospect which he can generally survey, though he cannot hope to verify each detail and visit every nook in the brief time allotted to him for travel. The desire *rerum cognoscere causus* urges him even more keenly than to know the things themselves. Thus, in biology, the laws of the genesis of every known organic being have now become as much the object of investigation as was once the nature of the being itself. The existence of definite species or varieties was formerly assumed in an arbitrary manner to be a kind of necessity. The search after the laws which produced those species, and the signification of them, has become as ardent as was once the definition of the specific characters. But it is a far more difficult pursuit, and requires either a very special education or remarkable natural powers. The difficulty pervades every department of biology in gross and in detail. Darwin seeks the solution for the whole kingdom of nature. The histologist, the pathologist, the

organic chemist approaches it in the detail of every mechanical texture, and of every organic chemical compound. We are apt to look on the museum of John Hunter as the most philosophic and extensive exposition of biological science in this or any other country. And justly so. Inquiring originally into what is the proper treatment of disease, he asks in order, What is its nature? what its cause? how are the functions disordered? how are they performed in health? by what mechanism? how is this mechanism varied? whence did it originate? But compare with his knowledge the knowledge of biologists of the present period viewed collectively; take our knowledge of the ovum, for instance, and its development, or the minute anatomy of the tissues, or (may I venture to use the epithet for so vast a collection of ascertained truth?) the *nascent* chemistry of living structures, or the relations of osseous structures in the vertebrata. It were hard to say which is the more remarkable, Hunter's comprehensiveness, or the detail of modern science. Yet how many details are still needed for a safe biological philosophy!

Yet are we only on the threshold of detailed knowledge. We still speak of many hard points with an almost childlike simplicity. What do we understand, for instance, of the cause of that which Herbert Spencer calls "Organic Polarity"—that is to say, the power, force, or tendency by which lost parts are repaired—by which a whole limb—or part of a limb—or even all but a whole body is replaced by the outgrowth from what remains of the original unmutilated whole—a process so common in asteriadæ and crustacea and other animals as to seem a matter of course in their history, while it is apparently a property which cannot exist in the higher animals? What do we know of the causes of hereditary transmission *in general* (a property wholly different from, and more unintelligible, than the hypothesis of natural selection), or of the transmission of disease *in particular*, as, for example, carcinoma? What is it in its essence? How does it originate in an individual of untainted family? How is it transmitted? Is it an original property of the ovum *per se*, or of the nutrient plasma by which that ovum is nourished up to the time of its birth? Could food, or mode of life, or any specific agent eradicate the tendencies to transmission, just as in certain cases we empirically modify the transmission of tubercle? or is the transmission of the carcinoma as inevitable in certain cases as the development of the germ? Grave questions for future solution.

These allusions to disease, I need not say, are purposely introduced. There seems to be a tendency in some modern physiologists to pay insufficient attention to the retrograde metamorphosis of living creatures. The study of death is as much an object of biological science as the study of birth. The whole being originates, reaches maturity, declines, and dies. So does every part. He strives with vain endeavour to grasp the history of any organic thing, who does not regard it in relation to its origin, its growth, its dissolution, its relations to objects external to it, the changes which it undergoes in itself and of itself, and the modifications, accidental or necessary, which external agents can and may induce in it.

General considerations of this kind have a certain, though subordinate office in scientific deliberations, and seem just now not out of place. It will be remembered that I have been speaking of the intrinsic difficulties of biological study. If I have correctly, though briefly, sketched the domain of biology, the existence of these difficulties will be conceded. They are now insisted upon, not certainly so much for the sake of those skilled experts, our teachers, who are carrying on the conquest of nature, as of those many cultivated learners who, from want of leisure, cannot actively pursue, but who, from real interest, desire to aid and promote the study of biology. For them it is desirable to take from time to time a general survey of the aims and extent of biology, in order that they may bring the weight of their influence in support—1st, of free, unfettered pursuit of biology for its own sake; and 2ndly, of public education, such as may conduce in the next generation to a just appreciation of its scientific, its educational, and its practical value.

I am thus led to consider, 2ndly, the prejudices of mankind, "*opiniones præjudicatæ*," in respect of biology.

These resolve themselves into active prejudices and passive prejudices. Active lead men to object to it as harmful; passive lead them to regard it with indifference.

These prejudices are rapidly undergoing modification, but they have existed harmfully more or less, from various causes, among almost all but professed physiologists. I need only advert among the active prejudices to the so-called theological dread of free inquiry into the origin of races, and the origin of species generally. Among the passive prejudices, I would point to the want of appreciation of purely scientific inquiry that has no practical end in view; to objections of various kinds brought

against experiments made for physiological, toxicological, or therapeutical purposes; to objections to the introduction of biological studies into courses of general education; to the tardy recognition of biological knowledge as the basis of practical medicine, and of hygiene, public and private.

History gives the clue to the source of these prejudices—namely, the empirical assumptions of supposed truths made at former, and often ancient epochs, which have one by one to be eradicated from their respective departments before the advancing knowledge of ascertained natural law.

What we see around us in the natural world is admitted on all sides to be the result of the operations of causes working by fixed laws. Why those laws exist, or how they came to be, it is not within the domain of physical science to discuss. What (in so far as they affect living beings) they are, and what the mode and limit of their action, including, of course, the mode and limits of their possible modification, is the special province of biological science. Science, therefore, is not only at liberty, but is bound, at all times to test the correctness of opinions which bear on or have relations to the subject matter of science, and do not appear to have been founded on adequate scientific evidence. A great part of the scientific work in the present century has been that of recasting or rejecting received dogmas. This work is not yet complete, and possibly never will be. It is evident that new means of research show the incorrectness of the belief of many of the greatest minds. Plato was satisfied that the use of the liver was to be the seat of prophetic agency for the soul. Yet are we sure that, notwithstanding the researches of Bernard, Pavy, and others, we know even at this moment all the functions and uses of that organ? How long since is it that taurine was found to contain 25 per cent. of sulphur, and was not, as had been supposed, devoid of that substance? How complicated are the chemical questions of the hepatic functions, when viewed as a whole throughout the animal series, may be seen by a glance at M. Milne-Edward's summary of these questions in his elaborate work now in course of publication.

The utmost toleration is required in dealing with the prejudices which we are considering: among other reasons, because truly there may be scientific prejudices as well as popular prejudices. A scientific man may become impatient of every opinion which rests only on probability; whereas, some of the important issues of human affairs are not susceptible of absolute proof. A physician, or a lawyer, or a moralist, who always refused to act on the greater probability would be a sorry adviser to his client. But the work of the chemist or the physiologist would be at once set aside if probability, and not ascertained fact, entered into his formula.

Different subject matters are taught or studied with different degrees of certainty, or by different methods; the methods and degrees of certainty must be known and acknowledged. There can be no just ground of objection to conclusions based on hypothesis so long as the promoters are ready to accept, on proper and reasonable evidence, new elements of calculation.

I spoke also of the passive prejudices of mankind in respect of biology. A curious chapter might be written on the slowness with which physiological principles have been generally received (I cannot say they are even now accepted by us) as the basis on which to secure public and private health. England is but even now awakening to these questions. The Registrar-General, the Army and Navy Departments, the Health Department of the Privy Council, the various Drainage Commissioners and Committees, and many other bodies, are all engaged in collecting, disseminating, and in using physiological knowledge under various aspects. It must be admitted that evidence as to what is and what is not favourable to the correct performance of the functions in men and other animals is even now often conflicting. It was said just now that the pure physiologist is too apt to disregard the processes "*præparantes ad mortem;*" so also he is too apt to look on health questions as problems of practice or art, and not of science. Yet the highest scientific qualities are requisite for determining with precision any problems affecting, for instance, nutrition, and the consequent capacity for labour of a population, viewed as a whole or as individuals: witness the investigations of your last year's President (now, happily, employed by the Government), and many of the important papers in Mr Simon's valuable yearly reports, and such memoirs as that of Professor Haughton, of Dublin, on "Work." In such cases, I will not say theory, but knowledge precedes, and regulates, and compels practice.

Similar considerations apply to the relation of physiology to practical medicine. This art or science is undergoing revision under the influence of physiology—a revision somewhat indeed retarded by popular prejudice, but certain.

In looking back on the history of medicine, we are at a loss to say which is the more curious, the sagacity of the older physicians and surgeons, considering the scantiness of their physiological knowledge, or their folly, considering the extent of it. The explanation lies in the intermixture of empirical (that is, of accepted, traditional, unquestioned) belief with really ascertained fact; and we are not now-a-days without danger of undervaluing the eminent artistic power and great practical shrewdness of former physicians, in the presence of our more precise, but sometimes also less practically valuable scientific knowledge. Dr Stokes, the eminent Dublin professor, has lately spoken on this topic in a timely and earnest way.

The business of physiology and of an association like this, as I just now said, is therefore not only to add new knowledge, but to destroy incorrect or imperfectly correct statement and belief. The incorporation of advancing physiology with medicine every year adds certainty to the latter, while it furnishes data as well as tests to the former. Experiment properly applied in medicine under trained physicists and chemists will not only eliminate gradually all remaining error, but will make more definite the properties of therapeutical agents. In illustration it is sufficient to refer to some of the investigations of Claude Bernard, from whose great skill, combined with philosophic power, much may be expected. Yet it may be doubted if the importance of this alliance between science and medicine to the community at large is yet fully understood by the legislature. Under the recent Medical Act, the whole expense of constructing a National Pharmacopœia was thrown by Parliament on the existing practitioners of medicine, and the cost of its future maintenance was charged on the students of medicine: the national funds are to contribute nothing towards the great benefit, a benefit accruing to every one at some period of life, of a genuine and philosophical revision of known, or the discovery of new, curative agents. Experiment alone can decide conclusively on the mode of operation of various agents on the human body and on animals. These experiments are always difficult, often costly. The Government, as I said, do not acknowledge the duty of providing funds. Perhaps the medical council might. It is indeed charged with the administration of the only public funds that are applicable to keeping, on a level with modern science, the national catalogue of remedial agents and the mode of preparing them. If it could be induced to expend £1000 a-year, as under proper management it easily might, in experiments and reports bearing on the physiological action of preventive or remedial agents, sometimes perhaps suggested and aided by the British Association, what might not be the fruit to science and to the public and private health?

I have been assuming, what no one here will question, that the basis of medicine is knowledge of biological laws. It is so, but only in the wide sense assigned at the outset to biological pursuits; viz., the study of the laws of decay as well as of growth —growth and decay of species as well as of individuals. But I must guard myself by saying that this does not include the whole basis of medicine. Physiological experiment is necessary to obtain the laws of action on healthy bodies, but alone it does not explain the laws of action on perverted organic structures or functions, as is seen in the common instance of the different effect of opium on a man in health and on a man in disease. Clinical observation is of course beyond physiological research, and must, from its far more limited field, follow rather than precede. It aims at applying, in due course, all safe and established results of previous physiological inquiry; and adds the deductions from investigations exclusively its own.

Much remains to be done in comparing the effects of agents, and the causes of those effects on man and on the inferior animals respectively. The knowledge which exists on these subjects has become, I need not say, both extensive and precise. But new problems are constantly arising from the discovery of new toxic agents. Even new diseases occur, as is well instanced by cholera, implying either new conditions of circumstances external to man, or new combinations of the internal conditions of man.

Accordingly fresh experiments are perpetually required to meet the new problems; and it has become the interest and almost the duty of States to specially train and to countenance skilled experts familiar with the most recent methods and researches in these directions, with a view not only to fresh scientific knowledge, but to the great practical results that may be obtained. It is sufficient to refer as illustrations to Bernard's experiments, such as those on the Woorara—to the question of physiological antidotes—and to the more precise notions of the physiological causation and mode of action of fever poison.

These, you will observe, though apparently what are called medical questions, are not less physiological questions proper, of vast importance to mankind.

A few more words in another aspect, and I will not venture further to trouble the Section, or delay our detailed work, which is ample enough. I have implied, what is sufficiently obvious, that physiology proper (I exclude such questions as the evolution hypothesis, which cannot be proved in this way), has become uncompromisingly precise, and that nothing will stand which does not bear the crucial tests of observation and, where possible, of experiment. But the experiments cannot in the present advanced state of physics and of chemistry be devised by ordinary men, nor even executed by them. Consequently every year old statements concerning the effects of agents so called physiological and therapeutical, are becoming of less value, and new ones of more. Most of us, who have passed the prime of life, must be content to learn from the more favoured in years. They who are young must be willing to be patient and laborious, if they would add anything of permanent value to physiological knowledge. The day in which hundreds of organic compounds are synthetically produced, and the microscope offers for mechanical analysis a clearly defining magnifying power of 5000 linear, is not one when rough work of hand, or conjecture unsupported by proof as to the chemical changes which go on within organic structures, will stand. What life is will long, perhaps always, evade our human ken; what is done during life, what can be done consistently with life, and what produces death among living things, every year makes more sure and more plain; every year makes the search more exciting, the reward more great, the reasons for admiration of the order of things on the whole more conclusive, and the admiration and awe more profound.

At the outset it was said that only very qualified assent could be given to the remark of a philosophical writer, that it is a prime necessity for biology that it should be separated from medicine. It has been my endeavour to show the amount of truth which belongs respectively to the remark and to the dissent.

Physiology, to sum up, is become a science, precise, of enormous extent, bringing to its support mathematics, advanced physics, difficult chemistry, accurate and comprehensive anatomy. Part of the basis of the science or art which averts or lessens suffering and disease, and postpones or makes easy death, depends in great measure upon its progress. But the applied and observational part can only be learned by the bed-side of the sick. Therefore pure biological science and pure clinical art must each have their votaries, but it must be the aim of each to learn from the other what is necessary for himself. May the State be wise enough (and it is becoming so in every civilised country) to appreciate these principles and their application. There never was an age—it is not ungrateful to the giants of old to say this—there never was an age when there were so many students, in the best sense, of biology and of medicine, actuated by a simple love of truth, and never a time when, as a class, they were so free from prejudice, so candid, and so patient.

The address of Dr Acland was received most warmly. At its close the work of the Section commenced in earnest. The members met five times.

ON THE ALLEGED DEGENERACY OF VACCINE LYMPH.

By Thomas Massey Harding, M.R.C.S.

On this subject every shade and variety of opinion has been expressed by persons whose opinions ought to carry great weight, and I think it would be impossible to determine the question on either side by the array of authority. It is well known that the report of the National Vaccine Board (1854) contains a decided expression of opinion that "vaccine lymph does not lose any of its prophylactic power by a continued transit through successive subjects." It is always interesting to inquire into the opinion of Dr Jenner himself, and we find him decidedly of opinion that the vaccine virus suffered no deterioration by repeated transmission. Dr Waterhouse, Professor of Physic, University of Cambridge, America, having practised vaccination for some time, became apprehensive that the matter had degenerated, and sent to Dr Jenner for matter as fresh from the cow as possible. Of this application the following remark is made, "This was not practicable or necessary, since it is well known to Dr Jenner, and to all other principal inoculators in England, that the matter suffers no degeneracy by repeated transmissions."

Ring, writing in 1801, says: "A considerable part of the matter now in use has

been preserved, by repeated inoculations, in the human body ever since the spring of the year 1799, yet, notwithstanding it has undergone so many successive trials, its purity has suffered no alloy and its efficacy no diminution." Ring has also the following:—"It is proved in a satisfactory manner by the experiences of Dr Colon, of Paris, and all the other practitioners in France, that the vaccine virus does not degenerate by repeated transmissions in the human subject." It may be supposed that Mr Ceeley of Aylesbury whose opinion on all questions connected with vaccination deserves greater weight than that of any living writer on the subject—was impressed with the conviction of the deterioration of vaccine lymph; but such is not the case. In a letter which he was kind enough to write to me, dated January 30, 1865, he says: "My own experiments were performed with a view to determine a pathological fact, not to procure a new lymph;" and in another part of the same letter, "I cannot say I am satisfied of the deterioration of the current lymph."

A great number of authorities may be cited who hold the opinion that vaccine virus has become deteriorated. They are all mentioned in the order of time in Mr Simon's report, and I will therefore quote briefly from Mr Simon, including also his own conclusions from the evidence which he has examined.

1818.—Mr Brisset, in "Mem. de la Societie de la Faculté de Médécine de Paris, 1818," and "Reflexions sur la Vaccine et la Variole," says:—"The phenomena, and especially the cessation, of the symptoms of the cow-pox seem to be notably abridged; the course of the disease is more rapid. The tumefaction incidental to vaccination (the development of which is so essential to constitute the activity of the virus and its protective efficacy) is infinitely less marked, if it can be said to exist."

1824.—Dr Meyer, of Kreutzburg, examining, in 1824-25, 4000 persons of all ages, found the older scars of vaccination more marked than the present one; and having obtained a supply of lymph of more recent date, he found it act with more power, and the resulting scars were of the old type.

1836.—M. Bousquet, "Sur le Cow-pox decovert â Passy, 1836," contrasts the action of the new lymph with the old, and says:—"We see that the new lymph is at once more quick and more slow in its course: more quick, because it takes effect more rapidly; more slow, because its effect lasts longer."

1837.—Dr Gregory became convinced that the vaccine lymph in use at the Small-pox Hospital had lost some of its efficacy. He employed some lymph which was taken by Mr Marson, resident surgeon, from the arm of a woman who had contracted the casual cow-pox. Dr Gregory found the new lymph more active than the old, and therefore continued to use it to the complete exclusion of the old stock.

1838.—Mr Estlin (*Medical Gazette*, xxii., p. 997) says:—"The alterations in the vaccine infection which have appeared to me most marked are—the smallness of the vesicle and its attendant areola, its rapid course, the absence of constitutional disturbance, the small quantity of lymph yielded by the vesicle, and especially the diminished activity of its infecting power."

Similar testimony has been given by Professor Hering, of Stuttgart, M. Fiard in a communication to the Academie des Sciences in 1844, and Dr Steinbrenner, Traite de la Vaccine, Paris, 1846, says:—"We may almost say that the pustules produced by the old lymph are to the pustules produced by lymph recently obtained from the cow as the pustules of the varioloid disease are to those of true variola. In fact, as in the varioloid disease the pustules produced by lymph of ancient date (that is, long in use) are less developed, desiccate more quickly, the constitutional affection which accompanies them is more transient, and they leave slighter cicatrices." So much for authority on this subject. Something may be learned by a careful examination of the phenomena of the vaccine disease as described by Dr Jenner and also by Mr Ceeley, and those ordinarily observed by vaccinators who employ the current lymph of the National Vaccine Institution.

There are two questions to be borne in mind,—1st, Are the phenomena of the vaccine disease different in the present from those observed by Dr Jenner? and, 2d, Is the protective efficacy of vaccination diminished? Let us take first one of Dr Jenner's experiments related in his own words:—

Case 17.—"I selected a healthy boy, about eight years old, for the purposes of inoculation for the cowpox; the matter was taken from a sore on the hand of the dairy-maid who was infected by her master's cows, and it was inserted, on the 14th May 1796, into the arm of the boy by means of two superficial incisions barely penetrating the curtis, each about half an inch long. On the seventh day he complained of *uneasiness in the axilla*, and on the ninth he became *a little chilly*, lost his appetite, and had a slight headache," &c.

Not to multiply extracts of cases, I will simply add that in all Dr Jenner's accounts of vaccination he speaks of pain and uneasiness in the axilla, loss of appetite, and other feverish symptoms.

We will now refer to the experiments of Mr Ceeley.

Mr Ceeley having succeeding in producing in the cow the genuine cow-pox by inoculating with variolous matter, took matter from the vesicles then produced, and vaccinated several children. In all these, says Mr Ceeley, the primary constitutional symptoms were very slight, the secondary proportioned to the extent and character of the areola; hence J. W. suffered severely, had vomiting and delirium.

In Mr Ceeley's next cases, he vaccinated two persons with matter taken from the variolated sturk. A sturk, I may say, is a young female animal about twelve months old. "The symptoms (he says) in both subjects appeared on the approach of the areola, and were rather severe during its activity."

Mr Ceeley, in conclusion, says:—"The constitutional symptoms, though mild, were commonly well marked. In infants restlessness, fretfulness, and inappetency; about the fifth or sixth day they were very common; very few escaped feverish symptoms on the ninth and tenth days; many had vomiting and diarrhœa. In adults, of course, more complaint was made—headache, chilliness, anorexia, and sometimes thirst on the fifth or sixth day, increased on the seventh day, with auxillary tenderness, but on the ninth and tenth days much general febrile complaint, disinclination and even inability to leave the bed.

I have quoted these words at length, as they contain the best account of the manifestations produced by inoculation, either direct from the cow or after very few transmissions. Will any unprejudiced observer of the effect of the lymph at present in use affirm that vaccination as now practised produces constitutional symptoms of equal severity to those above described? I have been a public vaccinator for ten years, and have vaccinated 400 or 500 every year. I know nothing of such symptoms. True, I have seen such effects, but so rarely that I cannot call to mind half a-dozen instances. The ordinary rule is, that vaccinated persons, whether children or adults, present no affection of the axillary glands—a condition noticed by Dr Jenner and Mr Ceeley in every instance; there is no feverishness; and as to inability to leave the bed, it does not occur once in five hundred times. I think it, therefore, a fair conclusion that the constitutional symptoms produced by inoculation with matter derived directly from the cow or from persons who have themselves casually derived the disease from the cow are much severer than those produced by the current lymph of the present day.

The second and more important question remains to be discussed, viz., Is the protective efficacy of vaccination diminished?

When Jenner announced his discovery it was the prevailing custom to inoculate with variolous matter, and in order to demonstrate, beyond the possibility of a doubt, the protective efficacy of the new operation, the vaccinated were exposed in every conceivable manner to the small-pox—put to sleep with patients suffering from the disease, and also inoculated with variolous matter. Nevertheless, it was found impossible to communicate the disease. The enemies were many and loud; they sought diligently, but in vain, for cases to bring discredit upon the operation and its founder. Hate and self-interest are sharp spurs, and we may be quite certain that no pains were spared to find cases of small-pox after successful vaccination. If it had been possible in the first few years after 1798 to find one fatal case of small-pox after vaccination, would the operation ever have made way with the public? Yet now it would be easy to find, not one, or ten, or a hundred, but thousands of deaths after vaccination. What explanation more rational or more probable can be offered, than that the vaccine virus has undergone some change during its repeated transmissions that has in some way diminished its power, especially when we consider that the local manifestations and constitutional symptoms are also modified, and, in fact, diminished? There is another reason why we should have expected *à priori* that this would occur. Inoculation of small-pox itself is known to be followed by a gradual diminution of intensity, so that in time the matter is no longer capable of producing the disease. Why, then, should not this change occur in the matter of cow-pox, which has been proved to have been identical in its origin, but diminished in its power by the constitution of the cow?

If it be true that vaccine lymph is capable of deterioration through long transmission, then it is obvious that a very large proportion of the population are insecure, for the National Vaccine Institution continues to supply the medical profession with lymph that has not been renewed, in accordance with their opinion, before mentioned,

that the prophylactic properties are neither lost nor diminished. I certainly think the weight of evidence is in favour of the opinion of the deterioration of the lymph, and should wish to see a general renewal of lymph throughout the empire, by means of a series of careful and well-conducted experiments in imitation of those of Mr Ceeley and Mr Badcock. This cannot be done by public vaccinators at their expense —it requires a great deal of time, patience, and perseverance, and is accompanied with considerable expense. I have myself attempted the experiment, being ably assisted by Dr Blakeway, veterinary surgeon of this town, but hitherto without success; and to convince my medical brethren that it is no easy matter to obtain a fresh supply of lymph by these means, I will quote a few words from a letter of Mr Ceeley to me, January 30, 1865. He says, "The variolation of the cow is attended with much trouble and great uncertainty as to success. One person may succeed in a few trials, while another may operate on nearly one hundred before he succeeds. It does not appear that every animal of the species is equally susceptible. The most successful operator I know, Mr J. Badcock, late of Brighton, chemist, now of Camberwell, London, told me that he had succeeded about thirty times after operating on 300 cows in the course of a few years."

It is quite obvious from this a complete renewal of the current lymph cannot be effected by the unaided efforts of the public vaccinators; it should be done at the expense of Government, and the lymph thus obtained should be employed at the National Vaccine Institution, and after a few transmissions sent out to the medical profession upon application. I do not recommend the general and indiscriminate employment of primary lymph; its effects upon some constitutions are too violent, it requires to be passed through some constitutions properly selected by competent judges before it acquires sufficient mildness to be appropriated for general use. I think that many repeated renewals of lymph could be effected in this way, so as in a short time to completely supersede the lymph now employed, and such a recourse to the parent stock for renewal of lymph may be had periodically, so as to maintain the action of the lymph to the standard of Dr Jenner. Such a course would materially improve the condition of the people of this kingdom, so far as their immunity from small-pox is concerned; but, after all the care, cases of post-vaccinal small-pox will occur. Let it be remembered, then, that vaccination does not confer an absolute, but a relative, immunity from small-pox, and the more complete the vaccination—that is, as regards the purity and strength of the virus and the number of punctures—the more complete the immunity.—*Medical Times and Gazette, Sept.* 23.

ON THE TOOT PLANT AND POISON OF NEW ZEALAND.

(*Concluded from p.* 502.)

In the North Island the Wanganui settlers use "drench," a mixture of gin and turpentine; or they bleed; while they sometimes also pierce the side of the animals to evacuate flatus—real or supposed. The Raglan settlers, again, bleed promptly from the tail or ear, resembling in this respect the generality of the Otago colonists.

B. *In Man.*—In the human subject the nature of the remedy is still more varied, though bleeding, emetics, and stimulants seem the most rational of those usually had recourse to.

Mr Manning says:—"The only native remedy I have ever heard of for the fit, or epileptic attack, occasioned by eating the berries, is a very barbarous one, and simply consists in nearly drowning the patient by ducking or holding him under water till he is all but smothered, and, when showing signs of life again, repeating the operation. I do not know whether this is of any use, but I think the patient would recover or die just as well without the remedy! I must also say, however, that I never heard of an instance of a native dying from the effects of the Tutu poison. This, perhaps, is because they know its effects, and, even when using it improperly, do so sparingly."

§ 8. Properties of other Species of Coriaria.

From the foregoing remarks it must, *inter alia*, appear that, while we know little, *if* anything, in this country, or generally in Europe, of the Toot plant or its poisonous *action*, at least one other species of Coriaria—a European one—enjoys an unenviable *notoriety* as a poisonous agent: the C. myrtifolia, whose leaves constitute a common

adulteration of senna. To the French this plant is well known as "Redout," or "Roudout." It is a common plant in Provence and Languedoc. Its leaves are poisonous, and are probably largely chargeable with some at least of the noxious effects generally attributed to senna. Guibourt asserts that its fruit causes convulsions, delirium, and death in man and the lower animals; and De Candolle says that these effects were produced by its seeds on the French army in Catalonia.

Professor Christison and others of our most eminent toxicologists give, in their works, numerous instances of the poisonous action of this, the only European species of the genus; some of which instances it is desirable, by way of comparison, to cite here, inasmuch as the effects both on men and animals closely resemble those produced under similar circumstances by the New Zealand species. There are various cases on record of death from eating its berries; but it is perhaps more usually deleterious or fatal when an infusion has been swallowed, as that of senna, of which it is too commonly an adulterant. Professor Christison mentions two fatal cases in children from eating the berries—one within a day, the symptoms resembling epileptic convulsions; in the other, a child of three and a half years of age, who had eaten about 80 to 100 berries, the symptoms were heat and pricking of tongue, sparkling and rolling of eyes, loss of voice, tetanus, and convulsions recurring in fits of eight or ten minutes' duration; death taking place within sixteen hours and a half. In another case, ten soldiers were simultaneously seized after eating berries, and two died. In the case of a male adult, death occurred within four hours after swallowing as medicine an infusion of senna, which had been adulterated with Coriaria leaves, the symptoms being violent convulsions, tetanus, and colic. The latter affection is so very rare as a result of Coriaria poisoning, that it is questionable whether it is not really referrible to the senna. In a third adult, who had eaten only fifteen berries, convulsions, coma, and lividity of face were followed by death the same evening, though the greater part of the berries had been ejected by emetics.

More than twenty years ago its poisonous action on the lower animals was experimentally investigated by Professor Mayer, of Bonn, who found the prominent symptoms (in cats and kittens chiefly) were violent fits of tetanus, followed by apoplectic coma. ʒj. of extract of the juice killed a cat in two hours when swallowed; ʒss., applied to a wound, killed a second in 85 minutes; six grains in the same way destroyed a kitten in three and a half hours. Ten grains of the extract of the infusion, applied to a wound, killed a kitten in six hours. Rabbits were found to be scarcely affected, whether the poison were administered internally or applied to a wound;* but one grain injected into the jugular vein caused, in about five hours, a single fatal convulsive paroxysm.

Notwithstanding cases so numerous and of so striking a character, doubts have been, and are still being, expressed by writers, as in the parallel case of "Toot," whether C. myrtifolia is poisonous at all!

I would venture to express here my suspicion that the whole genus Coriaria is poisonous; and, as such, my conviction that it forms a worthy subject for scientific investigation. An examination of the Toot poison will be incomplete without a review of the action on the animal system of the poisonous principles of the other species of Coriaria—all of which may prove to possess the same, or allied, poisonous principles, characterised by a Neurotic action.

§ 9. Appendix: Other Poisonous Plants of New Zealand.

I may add, by way of appendix, that several other New Zealand plants are asserted

* This is only corroborative of what the experimental physiologist constantly finds: that various of the lower animals are susceptible in very different degrees of the action of the same poison, which in some, indeed, may be quite innocuous. This occurred to myself in 1853, in the case of dogs, while engaged in a series of experiments instituted for the purpose of discovering the antidotes to certain common poisons, (Opium, Strychnia, &c.) *Vide* paper "On the *Non*-susceptibility of the Dog to the Action of certain Poisons," *Association Medical Journal*, June 9, 1854. Sir J. Emerson Tennent, in his Natural History of Ceylon, cites the following instances of deadly poisons, which are innocuous to certain animals. Speaking of the Mongous not being effected by poisonous serpents, he remarks, "Such exceptional provisions are not without precedent in the animal economy. The hornbill feeds with impunity on the deadly fruit of the Strychnos;" and in regard to the same bird he elsewhere in the same work explains further: "The hornbill abounds in Cuttack, and bears there the name of 'kuchila-kai,' or kuchila-eater, from its partiality for the fruit of the strychnos nux-vomica. The natives regard its flesh as a sovereign specific for rheumatic affections. . . . . The milky juice of some species of Euphorbia, which is harmless to oxen, is invariably fatal to the zebra; and the tsetse fly, the pest of Southern Africa, whose bite is mortal to the ox, the dog, and the horse, is harmless to man and the untamed creatures of the forest."

or supposed to possess poisonous properties: which plants and properties should be made forthwith the subject of proper investigation by local botanists, chemists, and physiologists. I recommend the subject to the attention of local scientific authorities for this reason, that I found the large quantities of Toot I had collected in different stages of its growth while in Otago, on arrival at home, in a state unfit for examination.* Professor Thomson found it impossible to obtain any satisfactory results from the specimens I brought home specially for chemical analysis. Such an examination, I believe, with the necessary relative physiological experiments, can be properly carried out only on the native soil of the plant, whose properties become the subject of examination.

It would be improper here to enumerate all the indigenous plants possessing poisonous properties, real or supposed; but, as a hint or indication to the local experimentalist, the following will probably suffice as illustrations:—

1. Phormium tenax, Forst. (N. O. Liliaceæ,) the common "New Zealand flax."—Captain Blewitt, of Wanganui, informed me that the red gum† at the base of its leaves is frequently poisonous in the North Island to starved bullocks and sheep put into a paddock to tread down and destroy the flax. The symptoms are simply gradually increasing emaciation, followed by death. *Post-mortem* examination reveals no visceral hyperæmia, or other indications of irritant action. Only undigested flax fibre is found in the intestines: which fibre and its indigestibility are supposed to have as much to do with the fatal result as the gum. Its root, however, is said to be purgative.

2. Sophora tetraptera, Aiton (Edwardsia grandiflora, Fl. N. Z.,) (N. O. Leguminosæ,) the "Goai" or "Kowhai" tree: the equivalent in Otago of our Laburnum.—Dr Hulme, the Provincial Surgeon of Otago, tells me he suspects its wood and seeds of poisonous properties.

3. Coprosma linariifolia, Hook. fil. (N. O. Rubiaceæ,) the "Mikimik" of Otago.—Its berries and the smoke of its wood are said to be poisonous. The berries of other two species, C. acerosa, A. Cunn. and C. lacida, Forst., are eaten by the natives.

4. Nesodaphne Tarairi, Hook, fil. (N. O. Laurineæ,) the "Taraire" of the North Island.—The kernel, or embryo, is said to be poisonous, when raw; but its berry is greatly eaten by birds, and, when boiled, by man. The berries of the only other New Zealand species, N. Tawa, H. f., are eaten without qualification or reservation by the Maoris, to whom the ripe berry is known as "Pōkerahū," and its pulpy portion as "Pōkere."

5. Leptospermum scoparium, Forst., (N. O. Myrtaceæ,) the "Manuka," or "Tea-tree" of the Maori and settler. In Otago, cattle often eat a little of it, and apparently without bad effects; but if they are starved, and compelled to eat it in larger quantities, it may be fatal, or very deleterious. The Maoris and settlers alike use a decoction of its leaves as a substitute for tea; hence its familiar designation, "Tea-tree." A strong infusion of the leaves is sometimes emetic, like green tea, says the celebrated navigator Cook, but a weaker or ordinary infusion is largely used as a substitute for tea by the colonists throughout Australia and Tasmania, as well as New Zealand.

6. Corynocarpus lævigata, Forst., (N. O. Anacardiaceæ.)—The kernel or embryo of the berry, (drupe,) which is known as the "Karaka" berry in the North Island, is considered poisonous *un*cooked, or till steeped in salt water; but the pulp of the fruit is eaten raw, and the kernel when cooked.

7. Convolvulus sepium, Linn., (N. O. Convolvulaceæ.)—The large tuberous rhizome is said to be eaten by the natives; whereas in Europe it is regarded as poisonous, and yields a gum-resin, resembling scammony, possessed of purgative properties. This,

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* These included Toot in three different states or stages of growth, all from the neighbourhood of Fairfield, Saddlehill, Otago:

(1.) Young succulent shoots, like those of Asparagus; collected in the early part of November 1861.

(2.) More mature shoots, expanding into leaf; or the tops of the young branches before flowering; collected in December 1861.

(3.) Banches in young flower; collected in January 1862.

All these suites of specimens were mouldy when unpacked from my repositories: but I had hoped they would otherwise have been of service in a chemical examination into the nature of the active poisonous principles of the plant.

Unfortunately I was obliged to leave Otago before the period of fruiting of the Toot, and so had no opportunity of collecting its seed; and the promises of the settlers to forward a sufficient supply of the latter for experimental purposes have not been fulfilled.

† In Otago I found this gum, which resembles gum-arabic, used as such by the settlers, and I have so used it myself. The flowers secrete a sweet watery honey, a favourite dainty of the settlers, and of which I have often partaken. It appears to be quite innocuous.

indeed, is the general characteristic of the roots of the species of the genus Convolvulus, (though there are marked exceptions, as that of C. batatas—the sweet potato, which is saccharine and amylaceous, and thereby edible.) Dr Hooker very justly remarks:—"The properties of the same species vary eminently in various localities. This is notoriously the case with many medicinal plants, which are of violent action in one climate and innocuous in others."

8. Solanum aviculare, Forst., (N. O. Solanaceæ.)—The "Porōpōro," "Pōpero," or "Kohōho" of the Maoris. Referring to its berry, which he says, "is eaten with avidity by birds and the natives," Dr Hooker observes:—"Cook's sailors ate it on the faith of the birds not being poisoned—a very dangerous experiment, as animals eat many fruits and leaves that are poison to man."

The berries of S. nigrum, L., appear also to be eaten by the Maoris—at least in the North Island; but I am, with Dr Hooker, disposed to regard the use as food of the berries of Solanum as a "dangerous experiment." The berries of both the species mentioned are, however, eaten in other countries: that of S. aviculare in Australia under the name of "Kangaroo apple."

S. aviculare is also mentioned among edible plants in Forster's "Commentatio de Plantis Esculentis Insularum Oceani Australis."

9. Cotula (Myriogyne, Fl. N. Z.) minuta, Forst., (N. O. Compositæ,) is, under certain circumstances, possessed of pungent, irritant, or sternutatory properties, causing sneezing when bruised under the nose.

10. Sicyos angulatus, Linn., (N. O. Cucurbitaceæ,) is probably poisonous, as are all plants of this order in their wild state.

It is satisfactory to be able to conclude my remarks by the statement that Toot is not now so dangerous, Toot-poisoning not now so common, as it once was in New Zealand. This seems to arise from two circumstances principally—that the plant is gradually disappearing from the soil with advancing cultivation and civilization; and that, its poisonous property being now more fully recognised, its fruit is now more generally and carefully avoided as a food or beverage for man, and its shoots as a fodder for cattle.

HYDROPHOBIA.

At the Veterinary Congress recently held at Vienna, a committee, consisting of Professors Pillway, (chairman,) Jessau, Fuchs, Husson, Förstenberg (of Edena,) Leisering (of Dresden,) Tscherning (of Copenhagen,) and M. Sondermann, drew up a series of suggestions for the prevention of hydrophobia. The suggestions were as follow:—

1. A register of dogs to be kept, in order that their number and the names of their owners may be known.

2. Each dog to wear a collar inscribed with the name of the owner, or otherwise marked, so that it can be distinguished.

3. The number of dogs to be kept down by all possible means, and the committee consider that the imposition of a tax is the surest way of effecting this object. (The committee did not express any decided opinion as to the expediency of exempting from the tax some animals of great use to their owners, such as sheep-dogs.)

4. Dogs not to be allowed to roam about in freedom and alone.

5. The use of dog-muzzles to be strictly enforced in all districts where canine madness makes its appearance.

6. In countries where hydrophobia exists, all dogs that have been bitten should be brought under the notice of the magistrates, that they may be placed under competent observation.

7. Mad dogs, and the animals of their own species which they have bitten, should be immediately destroyed. A dog supposed to be mad should be kept under observation until symptoms appear, and then be destroyed. If the symptoms after a time do not manifest themselves, the owner has a right to the animal. Wherever mad dogs have been, effectual disinfectants should be employed.

8. A regular supervision of the dogs of any district should be kept up, so as to enforce the tax, facilitate veterinary inspections when necessary, and supply the owners of the animals with rules to be observed on the appearance of hydrophobia.

BEALE ON CONTAGION.

Contagious Diseases in Domestic Animals.—The excellent example set by Mr Ceeley, (of Aylesbury,) Dr Budd, (of Clifton,) and others ought to be more generally followed, and practitioners, as well as scientific physiologists and veterinary surgeons, should carefully study the different classes of contagious diseases met with in domestic animals, and enter into much more minute detail than has been possible hitherto. Many, if not all, of these diseases are evidently, in their general nature, the same as those from which we suffer, though they are not specifically the same or mutually convertible. They seem to obey the same laws, originate under very similar conditions, are propagated in the same manner, and are probably to be prevented, relieved, or cured, upon the same principles. It seems almost certain that thorough observation, carried out with due care, would reveal to us the precise manner in which the marvellously minute agents already described produce their frightful results, and that from well arranged experiments we should soon learn how these maladies may be successfully treated.

We may, I think, feel quite certain that the thorough knowledge of the conditions favourable or unfavourable to the local origin and spread of contagious diseases in our domestic animals, will teach us very much concerning the same class of diseases in man. The contagious cattle disease now spreading, originated without doubt in cattle themselves, and resulted from the conditions under which they have been living for some time previously. As is the case with diseases of the same class in man, we find that although the exposure, as far as we can ascertain, may have been equal in degree—to some the disease proves fatal, while others are seriously affected by it, but recover; some, again, suffer from only a very mild attack, and a few perhaps escape altogether. Those which have been subjected to depressing circumstances, such as bad food, or an insufficient supply of food, or too much food, which is at least as hurtful as too little, foul air, or too little air, or bodily fatigue, are almost certain to be victims; while of the vigorous and well kept, many may escape.

Moreover, it is probable that by carrying out careful experiments upon those contagious diseases which affect the lower animals, important facts would be discovered which would add to our existing knowledge of the whole subject of contagion. In the lower animals most important experiments might be made with reference to the effects of inoculating different poisons. Who knows but that, by inoculating cattle with some fever poison of man, a mild disease might be produced which would render the animal no longer susceptible to its own special and much more virulent fever poison? It appears to me that active work in this direction must be productive of most important practical results, not only as regards animals, but to man himself. I am, however, well aware that these views, although based upon facts arrived at from careful and somewhat widely-extended observation, will appear to one considering them for the first time so speculative, that I cannot hope they will attract much notice from practical men, and I fear that amid the necessary detail their general bearing will almost be missed.

I will now try to sum up, in as few words as possible, the most important of the conclusions at which I have arrived with reference to contagious diseases.

The *materies morbi* of contagious diseases does not consist of lifeless organic or inorganic matter, nor of any form of gas or vapour generated in the decomposition of animal or vegetable substances, nor of any matter set free during the decomposition of fæcal or other excrementitious matter of animal origin; nor is it any species of animal or vegetable organism or parasite; but the active contagious material consists of exceedingly minute particles of living germinal matter, which may be regarded as the direct descendants of the germinal or living matter of an organism which has been for some time living under unusual conditions. Contagious poisons affecting men and animals have originated in their organisms. The living or germinal matter of some contagious diseases originating in the bodies of animals may grow and multiply in man, and *vice versa*. These particles of living germinal matter may retain their vitality for some time after they have escaped from the seat of their formation. They may pass through the air or be preserved in clothes, or various fluids, or moist solids. The smallest particle (less than the $\frac{1}{100,000}$th of an inch in diameter) being introduced into the body already in a fit state for its nutrition, may grow and multiply, giving rise, in due time, to the symptoms characteristic of the particular disease, and producing myriads of particles like itself. But it is probable that such particles, being introduced into a perfectly sound organism in a state of perfect health, would

not grow and multiply, but would die; or, in other words, such an organism would resist the influence of the contagious matter. Some of the germinal matter forming the *materies morbi* of certain contagious diseases may retain its vitality for a considerable period of time in a comparatively dry state, like vaccine lymph. Knowing what we do of the protecting influence exerted by vaccination, it seems probable that the ravages of many other contagious diseases besides small-pox may be mitigated or prevented by the inoculation of certain forms of contagious matter, which would produce allied but much less severe forms of disease. It seems desirable that numerous experiments should be instituted on cattle, with the object of ascertaining if any such protective influence would be really exerted.—*Medical Times and Gazette.*

THE SANATORIUM QUESTION AND THE CATTLE PLAGUE.

The Metropolitan Cattle Plague Committee are at issue with the Government on the best means to oppose the spread of the epizootic which threatens us with a dearth of beef and milk. The City Committee denounce the "indiscriminate slaughter" of infected beasts, which the Government have advised, and propose the erection of three great hospitals in the north-eastern, north-western, and southern suburbs of London, for the reception and treatment of bovine patients smitten with the distemper. They are, of course, opposed by the arguments that such sanatoria would furnish fresh and effective means of spreading the disease; that each hospital would be a focus where the poison by which the plague reproduces itself would be constantly concentrated, and whence it would be constantly disseminated; that the disease in itself is incurable; and that the amount of salvage in the shape of cattle that live through its cycle would be insignificant when compared with the amount of loss from the indefinite multiplication and re-enforcement of the contagious principle. The great argument on the other side, urged by Dr Letheby in the recent interview between a deputation from the City Committee and the Lords of Her Majesty's Council, was derived from the effects of the treatment of typhus and typhoid fever in the human subject. Dr Letheby said—"What would have been the result if, in cases of typhus or typhoid fever in the human subject, the practice had been adopted of not treating it at all? Treating that disease in hospitals, there was now only one death in ten; and applying that reasoning to this particular case, he came to the conclusion that it was a barbarous, unscientific, and cruel thing to send the infected animals to be slaughtered without an attempt to cure them." Now, it may fairly be objected to this mode of reasoning that there is really no analogy between the two cases—that of a man stricken with typhus, and that of a plague-smitten ox. The life of a man—at least in this country—cannot be appraised in pounds, shillings, and pence; the life of the ox is worth just what the animal will fetch at the market price. The life of man is so immeasurably valuable a thing, that it is difficult to say what risk should not be run to save it; the value of the life of an ox is so exactly known, that it is not at all difficult to say what risk should not be run to preserve it. If by allowing one ox to live there is a reasonable probability that two others will die, it is clear that it would be folly to prolong the existence of the first for an hour. In the next place, there seems good reason to believe that this cattle pest is far more contagious than either human typhus or typhoid. It is certainly not identical with either. It at least differs as much from these fevers as does ovine variola from cow-pox or the small-pox of man. We are so entirely ignorant of what contagion is, how it is carried, and in what excretion or secretion of the body it is localised, that it would be out of place to dogmatise on the matter; but there is no absurdity in the belief that, as the extent of the respiratory and cutaneous surfaces in the ox is so much greater than in man, and the quantity of the alvine and other excretions in the former so greatly exceeds those of the latter, the bovine animal must be a much more formidable engine than the human for the spread of a contagious disease. Again, disinfection can be practised in the case of an animal who is clothed and bedded as man is, with far greater certainty than in the best-arranged cowhouse or cattle sanatorium. But, even admitting there is an analogy in the case, we assert that the experience of fever hospitals does not afford much argument for the establishment of cattle sanatoria. In the first place, typhus and typhoid fever are neither of them curable diseases in the strict sense of the term. Who now believes in cutting

short a fever? The medical profession, by abandoning the violent remedies formerly in vogue, because the truth we are insisting on was not admitted, and by carefully watching and seconding the efforts of Nature in the means she adopts for eliminating the morbid poison, have reduced the mortality from these diseases considerably, although we think not quite to so low a standard as that at which Dr Letheby places it. If we remember rightly, the deaths from typhus fever are nearer one in five than one in ten. But all that medicine can do is to give the human patient the best chance of living through the disease. To argue, therefore, from "the curability" of these fevers, as has been done by many of the writers in the public prints, is to argue on an entirely mistaken and imaginary basis. A case of cattle plague is no more likely to be "cured" than typhus fever is to be cut short. After considerable and dearly-earned experience, the veterinary surgeon may hit on the best method of conducting his patient through the disease; but how long will it be before that experience is gained? and what a hecatomb of victims of contagion and treatment will be first sacrificed. Every day that a diseased animal lives, there is the certainty of its giving off particles of pus, or of germinal matter, or of miasm, or vegetable spores, or animal ova, which may infect fifty others; and, in our ignorance of what contagion is, and in our knowledge of the innate carelessness of the uneducated classes, we would not even trust the adoption in every cow hospital of Dr Thudichum's elaborate code for disinfection to avert the evil. Then, again, what is the fact with regard to fever hospitals as centres of infection? Is it not well known that typhus may and has been carried in numerous instances by convalescents from the London Fever Hospital? Do not all the nurses and doctors become victims in turn to the contagion? and this, be it remembered, is the case where every precaution is taken to prevent the spread of the disease by *fomites*—a mode of dispersion which it will be next to impossible entirely to control in the case of bullocks.

We hope we have said enough to prove that no true analogy exists between the case of the treatment of the continued fevers in man and the management of the bovine plague; and that were an analogy to be proved, the medical experience on the subject of the cure of fevers and fever hospitals does not furnish so conclusive an argument in favour of the proposed sanatoria as the partisans of the scheme would wish.

At this somewhat late period of the epizootic, the Government have announced that a commission is being organised to inquire into the orgin, causes, and mode of spread of the disease. There can be no doubt that this is a step in the right direction, although it would have been better had it been taken earlier. We have little hope, however, that the labours of the commission will throw fresh light upon the facts of the introduction of the disease into this country. The Privy Council have accorded to the city authorities permission to erect one sanatorium for diseased stock. We would recommend that this should be at least some miles from the Cattle Market and the London cowsheds, and that a strict *cordon* should be maintained.

Since our last article on this cattle plague, several State papers of importance in reference to it have been published. One is the Report of the French Minister of Agriculture, founded on the information collected by the Alfort professors, MM. Bouley and Raynal, during their visit of inspection to England and Germany. The French minister insists on the contagious character of the pest, on the facts that it is endemic on the steppes of Hungary and Russia, that it never develops itself spontaneously elsewhere, and that for the last fifty years it has been confined to its natural home by the vigorous quarantine measures instituted by the Governments of Austria and Prussia on the land routes. The present facilities and new modes of communication, however, are said to have increased considerably the chances of the disease overleaping or evading the barriers which Germany has hitherto raised against it. Thus, the English outbreak is traced to Russian stock sent direct by steamboat to the English market. The result of this report has been a decree of the Emperor forbidding the importation of cattle, raw hides, &c., from England and Holland. Dr Thudichum's memorandum on the best methods of disinfecting, published by the Privy Council, is a good example of how much talent and sagacity may be well expended in giving directions on a very commonplace and simple matter. Dr Thudichum, in recommending chloride of lime as the best and most reliable chemical agent for disinfection, gives an opinion which we are glad to have from so good a chemist. Amongst the innumerable letters on the subject which have appeared in the public prints, perhaps two of the most valuable are Messrs Saxton's and Payne's account of the outbreak at Mrs Minor's farm, and Dr Aldis's history of the disease at Eltham, which appeared in the *Times* of September 11. The difference in the post-

mortem appearances in the two outbreaks is worth noticing. In a case examined by Dr Aldis there were neither prominent nor diseased glands, nor ulcerations in any part of the intestines; whilst in one of the cases examined by Mr Payne the lining membrane of the stomach and small intestines was studded with a small vascular eruption similar to the pustules produced on the human skin by croton oil. Neither of these accounts, it will be seen, resembles that of the characteristic intestinal affections of human typhoid; neither is the resemblance confirmed by Dr Smart's elaborate report on the pathological appearances of the disease. He expressly states there is no ulceration of the intestinal glands, and that in this respect the condition of the intestine differs from that in ulcerative typhoid. The disease, however, whatever be its affinities, seems to be spreading, in spite of all that has been done to arrest it. This cannot be wondered at when we recollect that a commerce in manure and animal refuse is constantly going on, which it is next to impossible to supervise by any means at the disposal of the Government. It is some satisfaction, however, to learn that Ireland is as yet untainted. The distemper which was reported from Donegal turns out to have been the foot-and-mouth disease, and not the dreaded rinderpest.—*Medical Times and Gazette.*

THE EDINBURGH REPORT ON THE RINDERPEST.

By Dr Smart.

In compliance with the request of the Magistrates of Edinburgh, Dr Smart has investigated the pathological appearance and conditions of the cattle affected with rinderpest, and other forms of epizootic diseases at present prevailing among cows in the city, with a view to ascertaining the real nature of the disease or diseases, and the proper treatment thereof, and has made the following *interim* report:—

Interim Report to the Lord Provost and Magistrates of Edinburgh, on the pathological appearances of the cattle plague and other epizootic diseases at present prevailing among the cows in Edinburgh.

This *interim* report is restricted to a description of the pathological condition of the animals inspected. The dissections were made, with the assistance of Professor Strangeways, at the Edinburgh Sanatorium and at Tyne Castle, and the appearances noted were seen by many persons who were present on these occasions. The parts described and illustrated by drawings and preparations were selected only from examples of the pure and uncomplicated form of the disease.

DESCRIPTION OF PARTS.

I. *Windpipe and Lungs.*—The entire mucous membrane lining the respiratory passages is reddened and highly vascular, presenting the appearance seen in the early stage of acute bronchial catarrh. It is sometimes nearly dry, but more frequently, especially in the smaller tubes, there is an abundance of frothy mucus, often of a slightly red or sanguineous tinge. The membrane is entirely free of the aphthous eruption which appears in the mouth; and very rarely are there any indications of an effusive or depositive inflammatory condition. The air cells of the lung, in uncomplicated cases, are healthy; and when an emphysematous condition of the organ exists it is evidently chronic, and not, as represented, one of the morbid states superinduced by the disease.

II. *The Mouth, Pharynx, and Gullet.*—The appearance presented by the mouth is characteristic. The gums, lips, hard and soft palates, under-surface and root of upper-surface of the tongue, the superior surface of the epiglotis and epiglotic folds of membrane, and the pharynx, are marked to a greater or less extent by an aphthous eruption. This condition has been termed "ulcerous," but we have repeatedly shown that the subjacent membrane is entire. The roughened and granular aspect presented to the eye readily scrapes off, and consists of accumulated epithelium. It collects on the surface of the membrane around the orifices of the follicles. This gives it a punctuated or honeycomb appearance, resembling minute ulcers. It enters the pharynx, but is not at all found on the gullet or air passages. It occurs in only one other situation—namely, on the vulva at the junction of the mucous membrane with the integument. The gullet itself exhibits no trace of disease.

III. *The Stomachs.*—The first and second stomachs are generally loaded and dis-

tended with undigested food, which indicates their suspended function. No observable change of structure is apparent in either organ, and their lining membranes, as in other portions of the alimentary tract, are not reddened and congested. It is in the third stomach or omasom that the first marked changes of structure occur. These consist of irregular circular patches varying from the size of a pin-head to a crown piece. They are characterised by bright red or scarlet margins, which in the larger patches enclose a central portion of the dirty yellow and somewhat gangrenous colour. These very remarkable appearances are not invariably present, and have been met with in only one half of the animals dissected. They are found on the gastric folds or manyplies, and occur at varying intervals. The central portion of the patch is slightly depressed, friable, quite bloodless, and the papillæ on its surface shrunken, especially towards the middle; but there is not any breach of substance. The spots are found in every stage of advancement, and pass through the following changes:—A single papilla is first attacked, and its vessels become extremely congested. The congestion quickly extends to the neighbouring papillæ, and as the circle widens those first affected entirely lose their vascularity; hence their vitality is destroyed, and death proceeds from the centre towards the circumference. The bright colour of the outer ring, as determined by the microscope, is due, not to ecchymosis, but to the confluence of the congested papillary vessels. The knowledge of this fact explains at once the sharply defined marginate character of the patches, and their mode of extension.

I would here beg leave to point out a double error into which many observers have fallen. The superficial membrane of this stomach which so readily peels off in sheets, and is found adhering to the plastic surface of the food with which the stomach is usually found distended, is not, as often represented, a diagnostic mark of the disease. Neither is it the mucous membrane, as supposed, that shows so much facility of being removed. It is the epithelial layer which is cast, and the subjacent mucous membrane is left perfectly intact. This change is constantly going on in health, and the membrane can be removed (as I have often done) with light facility from the folds of the third stomach of a freshly-slaughtered, perfectly healthy animal.

It is in a very special manner the mucous lining of the fourth stomach, or abomasom, that suffers from the inflammatory change, if such a term can be applied where there are no inflammatory products. The morbid condition appears earlier in some portions of the membrane, but eventually every part is involved in the destructive process. In the earlier stage of the disease, the membrane is reddened only a little deeper than in health, but deepens as it advances, and towards the termination is dusky red with interspersed claret-coloured patches. The latter condition indicates a more, perhaps the most, advanced stage of morbid degeneration of mucous tissue.

The membrane, on more careful inspection, presents the following deviations from health. Firstly, its vital attachment to the muscular coat is generally loosened, and at many parts destroyed. Secondly, it is soft and friable, easily breaks down under any pressure, and, where the change is farthest advanced, peels off as if cohering mechanically to its sub-mucous connexions. Cracks and abrasions are thus readily formed, which have been mistaken for ulcers. Thirdly, the epithelium of the entire membrane is deficient and imperfect, and at many parts quite absent. Fourthly, the high colour of the tissue, as microscopically determined, is due, not, as has been stated, to sub-mucous or intramucous extravasation, but to vascular congestion in its most extreme form. The vessels being distended to their limits are greatly enlarged, but without rupture or dispersion of their contents unless artificially produced. Fifthly, in some instances, generally in stomachs of animals examined a few hours after death, some small ulcer-like depressed abrasions have been found. These are not true ulcers, and do not penetrate beyond the epithelium. In other instances, black spots, without breach of surface, and evidently due to pigmentation, were met with.

IV. *The Intestines.*—Passing from the abomasom to the lower bowel, the latter is seen to participate in the changes already described, although not to the same extent. The lining membrane of the whole of the intestine is in a state of nearly uniform congestive vascularity, resembling the condition existing in the muco-enteritis of cattle. It is the minuter vessels in the smaller intestine that are mostly injected. These are well seen by the naked eye in the various aborescent forms of their numerous and intricate reticulations. In the large intestine, on the contrary, it is the considerable vessels that are mainly and in a higher degree affected. This imparts to the gut a peculiarly striped aspect. This vascular engorgement increases towards the terminal portion of the canal, and the mucous folds of the rectum exhibit the tumid and deeply purple appearance of internal hæmorrhoids. The whole mucous lining of

the bowels is unduly soft, and its epithelium imperfect. There are no true ulcerations, and in this respect its condition differs broadly from the ulcerative typhoid of man. Not unfrequently a viscid fetid mucous covers the membranous surface. The bowel is usually empty, or its contents are fluid and slimy, but not sanguineous; sometimes there is (as first pointed out by Mr Scott) a discharge resembling the "rice water" stools of cholera. The ileo-cæcal valve is, as regards function, healthy, but its lining membrane, as also that of the cæcal appendage, is involved in the general hyper-vascularity. There is no sloughing or invagination of the bowel, nor any desquamation of its mucous surface in the form of casts.

V. *Glands.*—There has been much discussion as to the condition of the intestinal glands. I have repeatedly had occasion during the dissections to show that they did not share to any marked extent in the altered condition of the membrane with which they are so intimately connected. They are less prominent, and their outline is obscured by the discoloration of the superjacent membrane. They are never ulcerated, but a chronic tuberculous condition of the solitary glands is of frequent occurrence. This is commonly met with in healthy animals, and is not significant of any particular form of disease. The mesenteric glands show no lesion of structure. They are bloodless and shrunken, and their lacteal vessels are generally empty.

VI. *Kidneys, Bladder, Uterus, etc.*—The pyramids of the kidneys are usually the congested portions, while the cortex is pale, but the structure is entire.

The condition of the lining membrane of the bladder and urethra are variable, but in no instance seriously involved. The uterus exhibits no peculiar feature, but the state of the vagina is characteristic. The vulva is swollen, its membrane tense, and has a very red and irritable aspect. An aphthous eruption appears where the mucous surface joins the integument. A glairy ropy mucous flows from the orifice, and hangs in strings from the vulva.

VII. *Heart, Liver, Spleen, Blood, etc.*—The muscular substance of the heart, like the muscular system generally, is flabby and pale. Its condition is not peculiar, but such as is ordinarily induced by many exhausting diseases. There is no valvular lesion or structural change. The large vessels and their lining membranes are healthy.

The *liver* is of natural size, pale in colour, but sound in structure. The gall-bladder is usually filled with bile, which is thin and of a light green colour.

The *spleen* is too pulpy, and breaks down under slight pressure. The pulp is composed of broken-down tissue and blood cells of very dark colour. It is the splenic condition of exhausting fever.

The *blood*, when retained in the vessels of a dead animal, remains fluid for a considerable period after death, (Professor Lister.) Forgetful of this fact, it has been assumed that the blood in this disease is "watery and deficient in fibrine." In the single instance in which I have been able to examine the blood, excess of the fibrinous element was found. Should our further researches confirm this observation, additional light will thus be thrown on the pathology of the disease.

The blood is unusually dark in colour, and coagulates quickly and firmly out of the body.

The serous membranes, when the disease is uncomplicated, are healthy, and without effusion into their sacs.

The cellular connective tissue of the loins in some animals is in a perfectly emphysemateos condition. It is quite blown up and distended with air, and the appearance presented is unusual and remarkable, but not singular.

The parts not yet examined are the brain, spinal cord, and udder.

SUMMARY.

The number of cases examined and reported upon are insufficient as a basis of general inference, and the following conclusions are not intended to go beyond our present information:—

1. It is the mucous membranes that manifest the diseased condition principally.
2. They do not all exhibit precisely similar morbid states, nor suffer to the same extent.
3. In some of the membranes the pathological condition is constant and characteristic; in others it is variable.
4. Many of the pathological appearances present in the diseased organs are not peculiar to this malady, and are not distinctive. Thus *(e.g.)* the state of the bowel in the muco enteritis of cattle closely resembles that presented in this disease.

5. The condition of the bladder and uterus is such as occurs in all congested states of these organs.

6. The heart, liver, kidneys, and spleen may be regarded as functionally healthy. They are in the condition which results from exhausting disease of any kind, while the lining membrane of the air-passages exhibits the morbid change which occurs in acute bronchial catarrh.

7. The remarkable rings or patches found on the folds of the third stomach were found present in only a proportion of all the cases examined, and are not consequently distinctive.

8. The condition of the membrane of the fourth stomach is invariable. It likewise manifests the morbid changes in their most advanced and destructive form. It is, therefore, the most characteristic pathological lesion. The swollen, congested, and aphthous vulva and aphthous mouth have also been found invariably present. When these morbid conditions concur with that of the bowel in the same animal, the group is complete and decisive.

9. As regards negative conditions, there is no ulceration, and very rarely any trace of inflammatory products.

10. The reddened colour of the membranes is due to congestion in its extreme form, and not to ecchymosis or extravasation.

11. Emphysema of the lung is not, as has been stated, a concomitant of the disease.

12. Present information would appear to indicate that the blood, instead of being "watery and deficient," is in an opposite condition,—viz., that the water is deficient, and the fibrine increased.

13. We must not omit to mention an invariable and characteristic feature of the disease,—namely, the smell of the diseased parts, and especially of the abdominal viscera. The odour once experienced can never afterwards be mistaken. It is peculiar and distinctive.

14. As to complication, a proportion of two-thirds of all the animals examined were affected with pleuro-pneumonia.

ANDREW SMART, M.D.

EDINBURGH, *September* 12, 1865.

—(The *Scotsman*, Wednesday, September 13.)

THE CATTLE PLAGUE.

(*From the Florentine Medical "Imparziale."*)

A SERIOUS evil has now invaded England.

England has already suffered so much by it that commissions have been formed in London to try and remedy the scourge as much as possible. The Government and the best scientific men of the country, among whom are Gamgee, Symonds, Saunders, &c., have seriously studied the terrible plague. The able Professor Gamgee, almost the only believer in contagion in that country, had predicted the evil, but his words were not, unfortunately, listened to. We believe it to be the duty of scientific journalism, and even more that of the political, to popularise and protect those ideas, for when public health is concerned, liberty of commerce is next to nothing. It is said that as no remedy is useful against this epizootic, the sick cattle are to be killed, which fact already costs England several millions of francs; indeed it appears that to make up a little to the losers, more than two hundred thousand pounds sterling are required. All Europe has been put in commotion by this plague, against which, at least as a preventative, we should wish alkaline sulphites to be administered.

The Minister of Agriculture and Commerce of France has sent the illustrious Bouley to England, and the celebrated Reynal into Germany, to study the disease on the very spot.

Bouley having returned to France, read an elaborate report to the Imperial Academy of Medicine of Paris. He describes the malady with that extensive knowledge he possesses, observing that it was brought from Russia. He says the epizootic is extremely contagious; and affirms that it burst out in sheds, and among animals which were in the best hygienic conditions. He adds that it has even been transmitted by the men's clothes, and that the principle of contagion and infection is transmitted to great distances, and proves this with facts. He forebodes ill

for England, and fears that, as in 1713 and 1745, it may spread and strengthen for many years there. Ireland has taken strong measures for isolation, and is free from the malady. The French Government, after the report of Bouley, by which it was established, in the most positive way, that the cattle plague is contagious, has agreed to prevent the importation into France of horned cattle. Belgium has done the same, especially since Holland begins to have the disease. We hope that Italy will also take the strongest measures to prevent this scourge following on the heels of the cholera. We exhort Government to take due information; and as we are defended on the side of France and Belgium, let special preventive measures be taken on the side of Switzerland, and more especially of Dalmatia and the Rhine. Let them question their ministers who there reside, and send veterinarians to study, and this promptly; for had such steps been taken in the case of the cholera, who knows but what even this terrible catastrophe which is still tormenting our country had not been prevented? Therefore, after due information, one must act with most decided and frank rigour, if one wishes to prevent the calamity now threatening, and which, but two years ago, also invaded, in a most fearful manner, some of our Italian provinces. Doctrinal questions must be put aside, for if in other epochs it was denied that glanders and the bovine typhus were contagious, it is now no more allowed to be doubted.

FRACTURES IN THE LIMB OF A HORSE.

By M. Aubry, *Saint-Servain.*

In this paper it is advanced,—1*st*, that fractures in the lower part of the limb, such as the metacarpal and metatarsal regions, are much more amenable to treatment than those of the forearm and leg; and, 2*d*, that fractures of the humerus are usually curable on account of the very slight mobility of the shoulder in solipides. The lesser curability in the case of the forearm and leg is attributed in great part to the greater weight of the part below the fracture, which by leading to change of position materially interferes with union. M. Lafontaine's method of prolonging the bandages beyond the hoof, so that the weight could be rested on them, to some extent counteracted this. The curability of fractures of the humerus is chiefly accounted for by the great muscular masses that surround it, particularly the pectorals, the extensors of the forearm and the coraco-radialis, which form a strong natural bandage for this bone. Three cases are given illustrative of the paper.

1*st*, A four-year-old horse fell in the shafts of a heavy waggon, and on getting up dragged the toe of the left fore leg, which was semiflexed at the knee, and hung without any attempt being made to use it. There was constant tremor of the muscles of the shoulder, the skin of which was covered with sweat; and on moving the limb a very distinct crepitus was felt by the hand as well as heard. The fracture was complete, and close to the lower end of the bone.

This horse was turned out into a small paddock, where he moved on three legs in seeking his food, and in about a month the fracture was united, and there was left only a slight irregularity in the movement of the limb.

The second and third cases were fractures of the condyles in a two-year-old, and the other in a three-year-old colt. The fracture having been reduced, the leg was in each case maintained by four splints well padded, and covered by a bandage saturated in a mixture containing two parts of pitch to one of resin. In the first case the union was perfect in twenty-four days. In the second the animal was irritable, the bandages got displaced, and the union took place after a greater lapse of time, and with some deviation from the normal shape. It still, however, proved a very useful animal.

DEEP INCISION OF THE VAGINA AFTER DIFFICULT PARTURITION.

By M. C. Samson, *Veterinarian at Metz.*

After difficult parturition many animals die with symptoms of severe inflammation of the vagina and uterus. M. Samson considers that in such cases there are large clots of extravasated blood in the areolar tissue around the vagina, which first gives rise to great inflammatory engorgement, and afterwards undergoing decomposition becomes absorbed, and induces sceptic poisoning. In such cases he makes deep incisions into the lateral walls of the vagina, evacuates the clots, and washes the parts with chlorine water.

In one case the mare had foaled with difficulty eight days before, was in a state of great prostration, and almost completely off her appetite. The vulva was enormously swollen, the engorgement extending on the thighs and croup, and from the vagina escaped a blackish serous fluid, exhaling a gangrenous odour. Thinking the case likely to be a fatal one at any rate, M. Samson made incisions through the right and left sides of the vaginal walls to the depth of the entire length of the bistoury, and obtained from each side clots to the amount of about 2 lbs., extremely black and almost of the consistency of liver. The parts were then washed out with a large amount of chlorine water, and cauterised with a red iron. A draught containing a quart of urine, one-and-a-half ounces of cinchona bark, and a drachm of camphor, was then given. Next day the injections and the draught were repeated, and at the end of fifteen days the mare had returned to work.

Other cases are reported in which tepid water was employed in place of chlorine water, and the hot iron dispensed with, and they terminated equally successfully with the above.

The presence of clots is marked by rounded swellings on the walls of the vagina quite perceptible to the eye, and which under the pressure of the finger conveys a sensation like that of a piece of ling. Besides, where much swelling exists there is no danger attendant on deep incisions, while if sanguineous clots exist these will thus be removed.

ON THE INFLUENCE OF FLUIDS IN OBESITY.

M. Dancel, in a series of observations undertaken with the object of diminishing extreme obesity, remarked that they who consumed substances containing but a small proportion of fat did not become thinner if they still continued to drink abundantly; whence he was led to imagine that water and watery fluids favoured the deposition of fat in the body. He is surprised that attention has not been directed to this point, in the numerous experiments that have been made on dieting animals, where considerable quantities of fluid have sometimes been allowed; and he proceeds to adduce several remarkable instances that have fallen under his own notice. In one instance a lean cavalry horse was made the subject of the following experiment:—The daily ration of the animal was diminished by the deduction of 3lb. of oats, whilst it was allowed the usual quantity of straw and hay, and an abundant supply of water, with which about a pound of bran was admixed. In twenty-seven days the horse had gained nearly 38lb. in weight. In the same regiment was a very fat mare, that sweated much on moderate exertion, and that, like fat men, had abnormally liquid evacuations, and drank much, (nearly 60 quarts per diem.) On reducing the quantity of fluid to 30 quarts, the animal soon became reduced in size, free from perspiration, active, and energetic.

PROGRESS OF THE CATTLE PLAGUE.

(*From the Scottish Farmer of Sept.* 27.)

RESUMING our weekly record of the malady which has occupied for some time such a large share of public attention, we have to report, regarding the Edinburgh district, that on Wednesday last there was a considerable increase in the number of cases, no less than twelve having occurred—eight in byres previously affected, and four in new byres. Seven cases terminated fatally—namely, six in the city and one in the Sanitarium. On Thursday only two new cases were reported, but these took place in separate byres, where the disease had not existed before. The deaths on Thursday were seven in the town and one in the Sanitarium. On Friday three new cases occurred in infected byres in Edinburgh, and five cases in two byres not previously affected. Four deaths took place in town byres. On Saturday and Sunday sixteen new cases occurred in Edinburgh, of which five were in new byres. Ten deaths were also reported during the same period, namely, eight in Edinburgh, one in the Sanitarium, and one at Roseburn. On Monday, three new cases of plague occurred in old byres in the town; five in new byres: and nine in the country. Eight deaths took place in the town, and one in the Sanitarium. One animal was removed from the Sanitarium convalescent. Yesterday, four cases were reported in dairies in the Roseburn district which had hitherto escaped the ravages of the plague, and seven cases in byres where the disease had previously prevailed. Number of deaths in town, eight.

At the weekly meeting of the Edinburgh Dairymen's Mutual Protection Association, on Wednesday last, additional subscriptions were reported. Mr John Swan recommended that the Secretary of the Highland Society should be communicated with, in order that the co-operation of that body should be obtained to cause, or at least to advise, Government as to the necessity of the suspension of cattle markets on the usual stances in Scotland for six weeks. In the course of his remarks, Mr Swan stated that if any cattle from the markets of Edinburgh or Glasgow were observed at the Falkirk Tryst, intending purchasers would naturally be afraid to buy any animals on the ground, and the consequence would be, that men from the north of England and from Ireland bringing stock free from disease would have all left on their hands. This he considered would be a great hardship to those men; and in order to avoid this, he would urge upon the Highland Society the necessity of using their influence to secure fresh sites for the sale of cattle for the time he had specified. A desultory conversation took place, but nothing practical resulted, as it was the general feeling that Mr Swan's suggestion, good in itself, was somewhat apart from the objects of the meeting. It was the general wish, however, that Mr Swan, with one or two others of the Association, should wait upon the directors of the Highland Society, and explain to them the necessity of the course proposed.

The accounts received from Glasgow state that the disease is spreading in that city and neighbourhood. On Monday it broke out amongst a herd of cattle at Springburn and at Torrence of Campsie. In two dairies in Glasgow several animals were attacked with it, and Professor M'Call ordered their removal to the Moore Street slaughterhouse for examination. Another dairy was reported on Wednesday as having become infected. At the Glasgow market on Thursday, thirteen head of cattle were pointed out by Professor M'Call as being affected by the plague, and in one of the dairies in the Central District only two cows have been left out of a fine herd of fourteen. The stocks in several byres in the county where the disease has appeared are rapidly disappearing, and fresh cases are reported, dealers being blamed for its introduction

among their stock, by sending animals to market and taking them back unsold after having caught the infection.

At a meeting of the Justices of the Peace of Dumbartonshire, referring to the three cases which lately occurred near Bowling, mentioned in our last report, Mr A. O. Ewing thought it would be advisable that fleshers and others having transactions in cattle would endeavour to confine their dealings in the meantime to stock reared in the district, and refrain from buying in public markets,—an opinion which was concurred in by several of the Justices.

In the north, the plague is still confined to Aberdeenshire, but there have been more deaths; and the disease has broken out in another place in the parish of Peterhead, and in two new places in the parish of St Fergus, the parish which bounds Peterhead on the north. Every precaution is being used in the Peterhead and St Fergus districts to prevent the spread of this most fatal disease. Byres are being washed with chloride of lime, &c., and the cattle are being taken inside, as it is now but too apparent that this disease is both infectious and contagious.

From Dundee it was reported, early in the week, that with the exception of the byre in which the disease had appeared, all the other byres in the town were healthy. The Government inspector had used the disinfectant sent by Lord Kinnaird twice a-day upon the affected cows, but without any good result. Later intelligence informs us that the plague may now be said to be at an end in Dundee.

A meeting of the Justices of Peace of the county of Fife was held at Cupar on Tuesday week—Sir R. Anstruther in the chair. A report, signed by the Hon. G. Waldegrave Leslie, and Mr J. N. M'Leod, Kirkcaldy, was read, from which it appeared that the disease had broken out in a very virulent form on a farm at Thornton, and that already several of the cattle had died. The report also bore that these gentlemen had appointed Mr Balfour, V.S., Balwearie, to inspect the stock on the farm referred to, and report to the meeting of the Justices at Cupar. Mr Balfour, on being called on, stated that he had, as directed, inspected a number of cattle in a field at Thornton, and found several of them suffering from rinderpest. He found them gradually becoming worse, and considered their case as hopeless. In another field on the same farm he found several animals also suffering from the same distemper, and he understood that a few had died. He accounted for the rapid spread of the disease by the want of due precautionary measures. The meeting agreed, on the motion of Mr Balfour, Balbirnie, that inspectors should be appointed in the four districts of the county, and that a committee of three or four Justices of the Peace should be elected in each of the districts, to whom the inspectors could refer in the event of any dispute arising.

Yesterday, at the request of the Magistrates of Cupar, a meeting of proprietors and farmers was held in the Council Room, for the purpose of considering the propriety of discontinuing the monthly cattle-markets at Cupar in the meantime, in consequence of the prevalence of rinderpest. Provost Pagan occupied the chair. Colonel M'Dougall, Scotscraig, moved that the Provost, Magistrates, and Town Council of Cupar should be requested to discontinue the monthly cattle-markets until further notice, which was unanimously agreed to. It was also resolved to recommend that Ceres October Market, as well as all the other markets in the county, be in present circumstances discontinued, so as to lessen the risk of spreading the plague, which had already made its appearance in several places in the county.

A second case has been reported as occurring at the home farm of the Glen, Peeblesshire, fully a fortnight having elapsed between the two cases.

The plague has at length visited Galashiels. Mr Elliot, of Hollybush, had fifteen cattle grazing in a field in the vicinity of Selkirk, and no appearance of disease was

observed till late on Sunday afternoon, when symptoms appeared of what was considered only a simple ailment. Mr Connochie, veterinary surgeon, was early at the field on Monday morning, when one of the cattle was dead, and other four affected by unmistakeable symptoms of rinderpest. Mr Elliot, with praiseworthy decision, immediately killed and buried the entire lot of cattle. They were bought four months ago in Edinburgh, and no other beasts have been put beside them since.

Hitherto it has been generally believed that the plague was confined wholly to dairy stock, but this opinion has been proved erroneous by the fact that some store cattle which had been sent from the neighbourhood of Kirkliston to the Edinburgh market had taken the disease back with them to the farm, and infected the healthy stock on the place, notwithstanding that after their return from Edinburgh they had been put in a separate field from the other cattle. The owner had not been offered as much for his beasts in Edinburgh as he expected, and consequently drove them back, bringing infection with them. Another case, shewing the liability of lean grazing cattle to become affected, is reported as follows:—About a month ago, a farmer bought in the Edinburgh market some store cattle, taking the precaution to obtain along with them a guarantee of soundness for a fortnight—a period in which it is generally supposed the disease will have ample time to develop itself. Until the beginning of last week nothing whatever was observed to be wrong, but since then three have died, and it is not unlikely that more will succumb. The plague has also appeared within the last few days among several lots of store beasts—namely, a lot of Irish stirks in Dumfriesshire; a lot of Irish cattle bought at Falkirk Tryst, and put into a park at Blair Drummond; among two lots of cattle, also bought at Falkirk, and taken to the neighbourhood of Brechin; and in a lot of very fine Irish cattle near Coupar-Angus. The last-mentioned lot had likewise been purchased at the Tryst.

It was stated in the *Scotsman* of Monday last, that the plague has appeared in Ireland, or rather that it has existed in the county of Down, near Hillsborough, for at least a month, and that some thirty or forty animals have died of it; most, if not all, being dairy cows. It appears there is no positive evidence as to the manner in which the disease was conveyed to Ireland, the supposition being that it has been carried by sheep imported from Scotland and England, by way of Belfast. But if the disease has existed in the district "for at least a month," it is quite possible it may have been conveyed into Ireland previous to the date on which the Order of Council closing the Irish ports was issued. Our contemporary states that "there is a strong disinclination on the part of the owners of the infected cattle, as well as of the authorities, to give currency to information which might affect the pockets of the former, and shew the futility of the precautions of the latter; so that the true extent of the mischief done by the disease cannot be ascertained, nor can it be considered certain that it does not exist in other parts of the country. This reticence is, of course, easily understood, but it is most unwise; and it would be infinitely safer for the Irish stock-owners if the promptest measures were taken at once, founded on the possibility of the Hillsborough cases being actually "the plague." If it prove afterwards to be a less dangerous malady, the steps which may be taken to prevent its spread will not have been thrown away.

A deputation from the Markets' Committee and the Sanitarium Committee of the Corporation of London attended on Monday at the Privy Council Office, by appointment, to have a conference with the Lords of the Council upon the subject of the orders in Council, and some alterations in these orders that had been suggested by the Privy Council, and also to ascertain whether the Government would lend its sanction to the establishment of sanitariums, with a view to endeavour to discover

some remedy for the disease. The first subject that was introduced was that of the orders in Council, and the deputation called the attention of their Lordships to the vagueness of some of those orders, and to the difficulty of obtaining convictions at present under them; but they suggested that if additional inspectors were appointed, and the police were instructed to interfere more actively than they did at present, the orders now in force would probably be found sufficient. Their Lordships promised to take this into consideration. Dr Letheby then brought forward the subject of the proposed sanitariums, and said that he, as well as the medical gentlemen present, and a great many other professional gentlemen, were fully impressed with the conviction that the disease was curable if it was attended to in the early stage, and that it would be very important to endeavour to carry out this view by means of the proposed sanitariums. They were therefore anxious to know whether the proposition would meet with the sanction of the Government, as, if they were opposed to the establishment of sanitariums, it would be useless to proceed further. One or two others of the deputation also addressed their Lordships upon the same subject; and after a short deliberation, Lord Granville said that all that he could state in answer at present was, that the Government could not absolutely sanction the establishment of sanitariums, but they would offer no objection to the experiment being tried, or throw any difficulties in the way, and they would afford the facilities they could to carry out the object.

On Tuesday, at a meeting of the City Commissioners of Sewers, held at the Guildhall, under the presidency of Mr H. De Jersey, the chairman, Mr G. Walter called attention to the state of a slaughterhouse in Hosler Lane, Smithfield, which was complained of by the inhabitants of the locality as being a nuisance in consequence of the obnoxious smells arising therefrom. It was stated by the inspector that the slaughterhouse in question was used both for the slaughtering of animals healthy and diseased, and that during the past week eleven diseased animals had been killed there. Mr Walter said he thought the practice of slaughtering such animals in the same place where the healthy animals were also killed was a highly dangerous one, and put a question to Dr Letheby, the medical officer of the commission, to ascertain if it were not so? Dr Letheby said he thought the practice of slaughtering animals which were affected with the present prevailing disease in the slaughterhouses and knackers' yards was fraught with great danger, on account of its being a means whereby the disease might be spread to a large extent among the cattle in London and the neighbourhood. He thought it dangerous also, because there was not only a chance of the infection being carried by the slaughter-men engaged in those places to healthy animals, but from the mixing of the dung and offal of the diseased animals with the dung which was distributed as manure upon the land. After some discussion, the following resolution, proposed by Mr Walter, was unanimously adopted:—"That having regard to the prevention of the spread of infectious typhus fever among the cattle of London and the neighbourhood, the commissioners are of opinion that the present practice of slaughtering cattle infected with the disease in the slaughterhouses and knackers' yards of the metropolis should be discontinued, as there is great danger of propagating the disease by the dung and offal of the diseased animals being mixed with the manure of those places, and distributed upon the land." It was decided that copies of the above resolution should be forwarded to the Lords of the Privy Council, to the Markets' Committee of the Corporation, and the Metropolitan Cattle Plague Committee. Dr Letheby also reported that the markets and slaughterhouses of the city had been duly inspected during the past week, and that the inspectors had condemned 15,417 lbs., or nearly seven tons of meat, as unfit for human food. It consisted of forty-one sheep,

five calves, thirty-four pigs, 114 qrs. of beef, and 983 joints of meat. Most of it was in a putrid condition on account of the warm weather.

The Veterinary Committee of the Royal Agricultural Society of England has issued an address, calling upon the members of the society to co-operate with the Government, and with other agricultural societies, in the efforts which are being made for suppressing the disease. The address goes on to say that "the existence of this disease being regarded as a national calamity, it was right that the Government should take the initiative in adopting means for its suppression; and their having done so leaves little for the Royal or any other agricultural society to do, except to second the efforts of the Government. The several orders in Council which have been put forth, well calculated as they are to arrest the progress of the malady, will, nevertheless, prove non-effective to a considerable extent, unless they are backed by individual exertion. One of the chief, and in many instances the only cause of the extension of the disease into several fresh districts, has been the reckless manner that many persons have dealt with infected cattle. Not only have these been driven from place to place, and turned into fields separated only from large herds of healthy animals by an ordinary fence, but many have been sent to fairs and markets, and thus, by commingling with others, have spread the disease far and wide. All preventive measures are thus rendered of little avail, and unless practices of this kind are prevented by the vigilance of agriculturists and others, thousands of cattle will be lost to the country, in addition to those which have already perished. Every one should be impressed with the fact that the disease is the most infectious as well as the most fatal which is known to affect cattle, akin in its deadly effects to the small-pox in sheep, but not giving warning to persons by an eruption upon the body. Like small-pox of sheep also, the poison lies latent in the system for several days after being inhaled, and during this time the animal gives no indications of being affected, so that the most cautious persons may be deceived in the making of purchases. Another fact of equal importance, but not generally known, is that the special poisonous material, or infectious matter, on which the disease depends for its existence, is multiplied to an extent scarcely to be estimated in the system of every fresh victim; so that it is quite possible for one diseased animal to be ultimately the cause of the death of thousands." The precautions to be taken, as put forth by Professor Simonds, are repeated, with a concise description of the leading symptoms of the plague, and of the two other epidemic affections to which cattle are subject, namely, pleuro-pneumonia and murrain, or mouth-and-foot disease.

The cattle plague still occupies a great deal of public attention in Holland, and measures have been taken by every municipality for staying, if possible, the spread of it, by suspending cattle markets, appointing cattle surveyors, and by carrying out a sort of cattle expropriation law, by which the authorities are empowered to seize and kill all cattle of a suspicious character. From a report just published by the Government, it appears that up to 9th September 600 oxen had been attacked by the plague, of which 160 died, 50 were killed, and 70 recovered. The others were still under the care of veterinary surgeons. Bad as this cattle-typhus is, it is far less virulent and wide-spread than were similar maladies among cattle on several former occasions, and is already rapidly on the decrease. By far the greater part of the beasts attacked by this plague recover, whereas on former occasions beasts so attacked invariably died.

It appears that in some instances inspectors allow those animals which are only slightly affected to be sold for human food, while those in the more advanced stages of the disease are buried as speedily as possible. A correspondent of the *Glasgow*

Herald taken notice of this, properly remarks, that "every inspector ought to know that, before any symptom or external indication of any disease can become apparent on an animal, the blood or some internal organ is more or less charged or assailed by some ærial or other impalpable and invisible poison, possibly animalculæ or other cryptical formation inhaled or generated, which must cause both the flesh and milk of the animal to be poisonous." And we observe that Mons. A. Chauveau, Professor of Anatomy in the Imperial Veterinary College, Lyons, who is at present officially employed in investigating the nature of the cattle plague in this country, expressed, when in Glasgow, his decided disapproval of making use of animals slightly affected with the disease as human food, adding that the French Government would not allow a single pound of meat to be sold for such a purpose. In connection with this department of the subject, we take the following passage from a letter written by Miss Burdett Coutts, which appeared in the *Times* of the 20th inst.:—

"There are several other very grave subjects on which information is greatly needed. Is the meat of diseased animals fit food for man or for animals in any stage of the disorder? I have heard of sickness lately in kennels. Can this be attributed to the meat given to the dogs? The milk also, is it fit for use either during the attack or immediately after it? Some of my cows gave milk after doses of bi-sulphate of soda. I did not allow it to be used, but it could scarcely be expected that others should do this whose livelihood depended upon their supply of milk; and, if unnecessary to be done, the waste would be equally to be deplored.

"On the recovery of the only cow saved out of my herd of twenty, the milk was given to some pigs. They rejected it at first, and after taking it, sickened slightly. I forbad its use for a week. Surely it is a point of great importance to the public health, and should be ascertained, and inspectors should have the power of certifying that an animal is or is not in a fit state to be milked."

ARMY APPOINTMENT.

Veterinary Department.—R. Poyser, Gent., to be Acting Veterinary Surgeon, vice M. F. Healy, appointed to 15th Hussars.—*Gazette.*

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THE VETERINARY REVIEW

AND

Stockowners' Journal.

ORIGINAL COMMUNICATIONS AND CASES.

THE AIM AND OBJECTS OF THE VETERINARY PROFESSION.*

GENTLEMEN,—There are periods in the lives of men and institutions which may be well compared to that stage of disease which the pathologist terms the crisis. Events attain a climax, to be followed by renewed life or decay. Most people and the majority of undertakings have to battle with opposing forces at first; and it is often seen that fair wind and weather on the first launch into existence are not always the most favourable for men or their works. The storm must come, and those who can stand the test in their earlier days are found to float easily when circumstances turn in their favour. It is true that many do not survive the crisis, but those who preserve their masts and rudders unimpaired in times of trial profit by experience, and afterwards sail along smoothly in a career of usefulness.

In the history of the College of which I have the honour to be Principal, the present may fairly be regarded as the crisis. It is now ten years since I commenced lecturing in London. A large and attentive audience listened to my first discourse, and all seemed to augur well for the course of instruction that had been planned. On attending the second day at the lecture-room, not a soul was there; no students and no friends, until the hour for lecturing had passed. First one and then another called at five instead of four o'clock to hear how we were getting on, and as all chances of success turned on securing an audience, however small, for the earlier lectures, I managed to convince a couple of volunteers that it was important they should then sit down and listen. The lecture, therefore, came off an hour later than the appointed time, and my hearers were

* Inaugural Address of the Albert Veterinary College, delivered by Professor John Gamgee, October 2, 1865.

victimised until six. The plan succeeded. The third day more attended; the fourth added also to our number, and in a week or two the class grew to fair proportions, though it threatened at first to be worse than that of a certain professor of Sanscrit, who never had more than one student, and that one attended *pro formâ* to await the vacancy of the chair.

Success in London in 1855 led to an appointment in Edinburgh, where, in a twelvemonth, and after waging fierce war against the traffic in diseased animals, it was found incompatible with the interests of the old institution that any one so anxious as I was for reform in Veterinary education and practice should lecture within its walls. There were staunch friends who would not listen to my leaving the North, and funds were promised to establish a new Veterinary College. Eager for the fray, we set to work and transformed a wine cellar, notwithstanding damp, cold, and cobwebs, into a lecture-room, museum, and dissecting-room. A three-stalled stable and a forge completed our establishment. Students increased in number in spite of the inconvenience of having to attend lectures by gas at all times, until at last the cellar could contain us no longer. The students complained of being stifled with heat, and after some trouble an establishment, formerly built for a naval and military academy, was secured for our accommodation. The inconvenience attendant on ill-suited buildings at first was not the most serious one, for the old Veterinary Colleges and the Highland Society successfully opposed our obtaining Her Majesty's sign manual. Two years' fight and a little perseverance, with the aid and influence of some of the best men in the land, enabled us to overcome this difficulty, and the new Veterinary College not only prospered, but materially strengthened the Royal College of Veterinary Surgeons.

Three years since inquiries were made as to whether we would not, under favourable circumstances, remove to London. We did not approve of the step. At various intervals suggestions having a similar object in view were made, until at last we yielded, believing that in order to place this Institution in the foremost rank amongst the Veterinary Colleges of Europe, we really required the scope afforded us by this vast metropolis. You will therefore understand that the Albert Veterinary College has not sprung into existence in a day; it has been the work of years, and it has weathered many a storm. It has reached a crisis, and it is to be hoped it affords ample signs of renewed life and a prosperous future; that such is the case time will soon prove, and I venture to predict that if some confidence be reposed in us now, we shall, within three years, have the finest and best appointed Veterinary College in the world.

In stating this some may charge me with presumption, but, gentlemen, whilst it is proper and necessary that a man should have some confidence in his endeavours to prove useful, I do not wish it to be supposed for a moment that the success of the past has depended on myself, or that our future prosperity is to be due

to me. I have always felt that a College which depended on one man was a myth; the very nature and essence of a college imply the co-operation of men fit, each and singly, for special duties, and who, as a whole, render an educational institution more or less complete. During the past eight years the first object of our solicitude has been to train sound teachers, to aid deserving young men, to inspire them to work; and the result is, that the staff of this Institution is not only numerically stronger than, but I believe it is as fit for the service it has to perform as that of, any similar institution in existence. There is no department, however insignificant, left to take care of itself; and although I am told that such a system is an expensive one, it is my belief that whatever is worth doing is worth doing well, and whatever other people's notions are of economy, we cannot afford to do things badly, or leave anything to chance. This is by far the cheapest system in the end, and it is the only one which will last. For long, Veterinary Colleges in this country had but one responsible lecturer, and those who co-operated with him were called assistants. The professor exalted himself, and in some places still exalts himself, to the position of an indispensable omniscient, absolutely independent of much aid from others. Institutions where such opinions can for a moment be entertained are not colleges; they are monster pieces of deception, where young men never have been and never can be adequately trained. It is to the absurd systems of the past, and which in a measure still prevail, that Veterinarians in this country have not held a proper position amongst scientific men. Those who advocate the antiquated method of teaching Veterinary science ascribe all their ill-success to the students themselves—to deficiency in early education amongst those who enter our colleges. We can afford direct evidence to overthrow such a theory, and have always asserted, and still believe, that the causes of failure have existed in the Veterinary Colleges themselves. These causes have mainly been cramming, grinding, and negligence.

By cramming, I mean committing a student to study every branch of Veterinary medicine as soon as he enters college, and having attended one session of five or six months' duration, he has been sent off for seven months' vacation to return a second winter term for five or six months, attending the same lectures on the same subjects as during the first, and then examined for his diploma. How can a man learn anatomy, physiology, chemistry, materia medica, medicine and surgery, on such a system?

To render the cramming system complete, grinds, or periodical examinations to enable students to reply parrot-fashion when examined for a diploma, were long since instituted, and every medical man knows that the grinding system is only suited for fools or idlers, and the less of it we have the better for men whose brains can be developed by rational teaching. I have no respect for a doctor or veterinarian who has not educated all his senses to the fullest possible

extent; the grinder only wants men to hear and speak. They can wear kid gloves, and scorn the idea of offending their noses in a dissecting-room. They may be perfectly innocent of the sight of blood or the interior of a forge. All is superfluous save and except an art of medical mnemonics which is well understood by an expert grinder, who may be declared extravagantly complete when, in addition to a professional catechism, he can use chalk on a black board.

The third cause of failure in training skilled Veterinarians has been negligence; leaving young men to grope in the dark until they become disgusted with the subjects, which they first try and fail to learn. We have long since adopted the tutorial system, whereby students are not only asked to listen, but are shown how to see and feel. The ablest and most willing require much assistance at first. In the study of medicine it is a long time before they can walk alone, and a vast number never can walk at all. If they could, we should have less empirics and heterodox practitioners.

In this College we have set our faces against the cramming system; we have offered tempting premiums to those who in their first year would attend to nothing but anatomy, physiology, and chemistry, and indeed only to the most essential fundamental branches of these. We have opposed the grinding system, and our free-studentships have been carried off by men who either would not or could not afford to attend a grinder. The result has been that very few of our students have ever been rejected for their examinations, and many men have been trained thoroughly fit to teach as well as to practise. I hold that this is the very essence of the stability of a college. Without a good substratum of talent and efficiency, any institution such as our own must rot and die.

But let us go a little deeper in ascertaining why the Veterinary Profession has held no position in this country, and why well-directed efforts made to raise it deserve national support. The comparatively small body of Veterinarians in the United Kingdom has been engaged exclusively in the treatment of sick animals, and in making whatever living could be secured just in proportion to the stock-owners' losses. The more disease, the more money made by Veterinarians, and *vice versâ*. Often have I heard practitioners say that it was not right to enlighten the farmers; that they were getting too knowing by half as to the way by which the most important diseases might be prevented, and so on. We have always set our faces against such doctrines. It is not our desire to help the owner of race-horses when his animals have broken down, by blistering and firing, or nipping horses' legs in two by bandages. It is little consolation for a man to have a horse capable of standing firmly on four legs after having failed to realise the reward which was expected from the time, trouble, and great expense incurred. In ninety-nine cases out of a hundred a good horse only breaks down after weeks and months of great mismanagement, and it is in counteracting the causes of such a disaster that an expert Veterinarian is worth

having. Veterinarians have not been trained for such work. They are told that their connexion with the forge lowers them, and the less they look so low down as horses' feet the better. We hold a direct contrary opinion, and have always acted up to it.

One of the first points I turned my attention to in Scotland was the prevalence of intestinal disorders amongst horses, and having collected reliable statistics, to prove that of the animals used by agriculturists, nearly sixty died of colic out of every hundred that died of disease, I wrote and spoke on the so-called boiled-meat system, feeding horses as we should an omnivorous pig, and pointed out the killing influence of the draughts of turpentine, oil, and opium. Although it is to he hoped I injured the sale of the noxious potions, many a farmer has saved much money by following the advice given. In this College my father has taken especial charge of many of these matters relating to the prevention of disease and suffering in horses. I only followed in his steps even at the commencement, in attending far more to the prevention than the cure of the disease. By thus studying causes, when the time comes for application of remedies in a diseased state, we have an infallible guide in the majority of diseases.

Circumstances have led me to take a very active part on the subject of Cattle Disease Prevention. Having paid much attention when abroad, especially in 1854, to the maladies most destructive amongst horned cattle, I became informed with the fact that the great ignorance and negligence manifested in this country, in relation to ever-spreading plagues, might be reckoned a truly national calamity. When first I left London, after obtaining a diploma, and having worked a little harder than many people do at such subjects, I was most lamentably ignorant of the nature and extent of prevailing epizootics. Foreign literature and foreign professors soon opened my eyes, and on returning to England, I resolved on doing all in my power to rectify great evils. Losing a minimum of four millions sterling annually by Cattle Disease alone, and of this, upwards of two millions by that readily preventable disease, pleuro-pneumonia, it was impossible not to see that if one or two thousand Veterinarians properly organized on the Continental system could preserve us from such loss, the country could most richly afford to pay for such services. I attacked the foul traffic in diseased animals, exposed the evils attendant on the sale of diseased meat and milk, and, up to the present time, have continued to indicate by what means our cattle might and should be preserved in health. The reward for all this labour has been, in times past, the determined opposition of the farmers themselves—when advocating proper legislative measures, resolute attacks on the part of cattle dealers and the old Veterinary Colleges. I have stood absolutely alone; but there is this small item of consolation, that, had I been a prophet, it was impossible better to foresee what has come to pass. It is not to be expected that this will be acknowledged, in spite of irrefragable evidence in the columns of

the *Times*, in printed lectures and speeches, or reports. It is true that all I have done, especially since 1855, has been fairly and freely to state what any man with his eyes open, and a knowledge of the subject, should have known.

I have pointed out the great evils attendant on an importation of live stock without adopting proper precautions against the spread of disease. My opponents have charged me with being an anti-free-trader; but I never could understand that the propagation of disease had anything to do with the principles of free-trade. I advocated the establishment of foreign stock markets, and a rigid inspection of markets and fairs. Well knowing the difficulties attendant on market and fair inspections, I spoke in favour of collecting statistics of disease in animals, and having a system by which any outbreak might be instantly suppressed. The Earl of Shaftesbury, who presided over the public health section of the Social Science Association at Liverpool in 1858, when I brought this subject forward, was so impressed with the importance of my suggestions, that he did all in his power to rouse Government to take up the matter. At different times there has been a species of panic as to the approach of the Cattle Plague to these shores. My advice was to prevent any direct importation of Russian cattle from the Baltic ports, and to establish foreign stock markets as stated above.

Having failed to get Government to move, I strove to bring a little pressure on my countrymen from abroad, and in the month of March 1863, issued the following circular :—

PROPOSED INTERNATIONAL CONGRESS OF VETERINARY SURGEONS,

To be held in Hamburgh, from the 14*th to the* 20*th July* 1863.

It is a fact well worthy of notice, that with progress in the commercial relations established between different countries, with greater facilities for the transit and sale of stock so as to meet the demands of Western Europe, there has been, during the last twenty years, an increased prevalence of contagious disorders.

The want of accurate statistics relating to the losses sustained by plagues communicated from country to country, in the lines of communication established by trade, is severely felt. It is owing to this want that no measures have been suggested to, or, at all events, adopted by, the several Governments of Europe, for their individual and mutual benefit; and that Europe is now suffering, to a very considerable extent, from the system by which one people attempts to save itself from loss by disposing of diseased and infected stock to another.

It is with a view to give an impetus to the rearing of stock—it is as a means of direct encouragement to agricultural enterprise—that it is proposed to hold an International Congress of the Professors of Veterinary Science at Hamburgh, and of members of the Veterinary profession generally, during the period that agriculturists are invited to derive all the advantages of an International Agricultural Exhibition.

It is hoped that the representatives from different parts of Europe will meet together with an earnest desire to demonstrate the importance of Veterinary Science, and with a view to suggest a uniform system throughout Europe for the prevention of plagues, that are a source, at all times, of pecuniary loss, and not unfrequently of disease to man.

In order to fulfil these objects, it is proposed that the representatives from different countries should communicate in the form of essays as much information as possible on the following points :—

Firstly, on the extent to which contagious diseases prevail in their respective ntries.

Secondly, on the imports and exports of live stock, and on the direction in which the plagues chiefly spread in each country.

Thirdly, on the means recognised by the author of the essay as most effectual to prevent the diseases.

Original papers on any Veterinary subject may be read during the International Congress.

It is, moreover, proposed that, with the aid of the information thus obtained, a statement of facts should be prepared, and resolutions drawn up, to be submitted to the different Governments of Europe, with a view to the institution of a uniform system for the protection of stock from plagues, which owe their origin, as a rule, to the climates and soils of the East.

It will then remain for the people or the Governments of different countries to adopt or reject the propositions of those best qualified to advise on the important social questions to be discussed at the International Congress. If the advice be acted on, the object of the Congress will be achieved; and if not, there can be no doubt that an interchange of opinion and a collection of facts cannot fail to interest as well as benefit the Veterinary profession in all parts of Europe.

The Congress was a great success; Great Britain was one of the few countries not officially represented, although from it the idea emanated. Fortunately the same cannot be said of the second Congress held during August last in Vienna.

I do not wish to tire you with an enumeration of the efforts made to get attention paid to filthy railway trucks, dirty ships, and similar points of great moment, but after the Congress had been held and a direct trade of foreign cattle was increasing with the port of Leith, I made special inquiries as to the probabilities of Russian cattle being brought direct to this country. On the 10th of November 1863, I wrote to the *Times* as follows:—"If we are receiving Spanish cattle in very fine condition by sea, what is to prevent a fast and suitably built steamer landing at a British port cattle shipped at Memel or Libau? Cattle are very cheap in Russia, and the Russians are turning their attention to the management of stock. If we do not husband our resources in the way of producing and fattening animals in the British Isles, we must depend more and more on the produce of Eastern plague-breeding plains, and we may find ourselves, at no distant period, much worse off for animal food than we are at present, notwithstanding every facility being afforded for free trade in stock. Dearly-bought experience has demonstrated to the Austrians, Prussians, French, and others, that the importations of cattle require constant supervision. Your correspondents have this year furnished valuable information concerning the cattle plague as it spread through Turkey, across the Adriatic, and into the Roman States. The area over which this fearful malady has extended of late has been far wider than usual, and it has been found essential on many occasions to enforce a strict quarantine and otherwise to interfere with the trade in cattle. For the safety of British stock, and for the instruction of British stockowners in general, information concerning the health of animals in different countries should be published periodically; and it would be easy to devise a system of showing the diseased and healthy regions of Europe in maps, which any cattle dealer should consult. On such maps the course in which plagues spread, and

perhaps even the extent and direction of the cattle traffic, could be indicated. In a short time such a mass of information would be collected as to show how we should act to encourage the trade in healthy animals, and effectually to guard against the traffic in diseased ones."

I must confess it is rather hard to find that, after many years' effort and steady investigation, we should be denounced as ignorant, inadequate for the occasion, and unworthy of public confidence. Such charges have not been made against me personally, but they have been made against my profession, and as a member of that profession I feel them.

In reply, we can assert without fear of contradiction, that had our warnings been listened to, the cattle plague would not have been imported into this country last spring. Admitting, for argument's sake, that it might have reached London, as it did, early in June, if such measures as could have been adopted by persons knowing the disease could have been enforced, it would have been stopped at once. Rational measures, such as should have been used since, have not been brought into operation, and because the Government is powerless, or imperfectly exercises its prerogative, we have the statement made that Veterinarians are ignorant. Give us full power to direct in matters which those alone who have special knowledge of the subject can understand, and in three months the disease will be exterminated. Continue as at present, and three years may not see us to the end of it. In some parts it must soon cease, as the animals are all dead or dying; in others it must penetrate according to the activity of trade—the cattle trade cannot be stopped, and should indeed be disturbed as little as possible. There is great reason for regret that Professor Simmonds, who saw the disease early in June, and the Government, who issued an Order in Council on the 24th of July, did not adequately warn the farmers of the appearance of the disease. Acting under the advice of Professor Simmonds, the Government said, full five weeks after the malady broke out in London, "that a contagious or infectious disorder, of which the nature is at present uncertain, has lately appeared and now prevails among cattle within the metropolis and in the neighbourhood thereof."

On the 29th of July I arrived in London, and knew as much of the existence of the steppe murrain as the country at large. Having heard of the strange disease, I visited several dairies, saw the malady, dissected some animals, and on the 31st addressed a meeting at the Marylebone Institution on the subject. Thanks to the public press, it was at once known throughout the length and breadth of the land that the cattle plague was in the country, and farmers were put on their guard as to purchases they might make. This alone has saved many a man from serious loss, and it is deeply to be regretted that the alarm was not given one month sooner. We formed the National Association for the Prevention of Cattle Diseases, which at once issued circulars to railway companies, steamboat proprietors, and many public

bodies interested in the subject, and calling for co-operation so as to check the spread of the most infectious of all known diseases. We have met frequently, visited infected sheds or farms, given the best advice we could, and though it has not been in our power to do much of late, I believe the Association will be of great service even when the cattle plague is forgotten. I must say that the experience of the Lord Mayor and Corporation of the City of London has been participated in by us, and we find it almost impossible to get the public to take that proper part in a good work which they should. If we ask an individual for a guinea per annum for a society having the most useful objects in view, the first question he asks is, "What are you going to give me for the guinea? Will you stand the loss on my stock if I get the disease? Will you come down into the country and look after my animals?" and so on. In spite of all this, however, the Association will prosper, and whenever it can be of use, it will not be found wanting. It can do much, though that much is far short of what those in authority have it in their power to do.

Many associations have been formed for the insurance of cattle, but they are, as a rule, working most unsatisfactorily; and if the Government, if our Chancellor of the Exchequer, could be guided so as to benefit by the opportunity, a system could be formed which would add to the public revenue, materially protect the farmer, and enable us to kill out the plague. We do not want an indemnity fund from the national purse, but we could well do with a national cattle insurance system, in which every farmer would have confidence, and which in time would realise enough to defray the expenses of proper supervision, of a national disease prevention system, and whilst affording a substantial security to the farmer and his landlord, would help to melt down the national debt. These remarks are not made without most careful calculation. If the Government can deal with the insurance of human lives, which can be carried on without its assistance, why should it not turn its attention to the insurance of cattle, which cannot fairly be introduced into this or other countries without the co-operation of Government.

Had we an insurance system in which all the farmers had confidence, we could adopt proper measures, and soon extinguish the disease. Many people are impressed with the laudable idea that the malady should be cured—that specifics might be found for it. The cattle plague is more deadly and more infectious than any other known disease affecting men or animals. Keeping stock in life implies favouring extension of the disease, and no fact has ever been better established than that you must treat herds affected with this malady as you would glandered horses. Suppose the Commander-in-Chief issued an order to compel Veterinarians to treat or experiment on the treatment of glandered horses, what would be the result? Some animals in which the constitutional taint was not developed, in which the disease was confined to the nose, might recover. The number thus cured would be infinitesimally small, whereas the number con-

taminated, by keeping the glandered horses alive an hour longer than we should, would be enormous. Much as the opinion may jar against those who believe that God has granted a remedy for every disease, I assert that severe cases of the Russian plague are and ever must be incurable, and you might as well try to revive a lobster after he has turned red in boiling water. Many animals afflicted with this disease are from the commencement of the attack virtually dead, and their tissues putrify long before their heart ceases to beat, and their nervous system is paralysed by death's process.

I shall not detain you longer on this subject. In referring to it, it was my desire to show that Veterinary science is of the highest importance to any country. It holds a position second to no science in its utilitarian aspects, and an efficient body of Veterinarians can warn and protect countries of dangers which are greater even than the advent and dissemination of human cholera, and other forms of human pestilence. Cattle plagues impoverish and weaken countries. We are strong and wealthy yet in these dominions; but ruin our farmers and stop our animal food supplies, provide no milk for our children, and, both in health and substance, wide-spread suffering must prevail. It is the province, therefore, of Veterinarians to protect countries from great calamities; this is the first object they should have in view, and I regret much to have to say that in Great Britain this duty has been neglected, in spite of our having often spoken of the duties imposed on us as a body. It is to be hoped now we shall all work hand-in-hand for the common good; and that our students will no longer find it tedious, as they often have done, when we devote a score of lectures to the deadly murrains of the world.

In conclusion, permit me to press on all the claims of this Institution to public support. It owed its origin to efforts made for the prevention of the diseases of animals. I hold that it is the only Institution of its kind that has trained men for the real object they should have in view, and it is to be hoped it may be treated according to its deserts. We have had some difficulties in getting all matters fairly arranged before this date. If you walk through this our temporary establishment, you will, I think, find that the comforts of students have not been neglected, and the accommodation for our patients is of the best description. I am happy to be enabled to say that after a correspondence which has been extended over three months, we have finally secured the admirable plot of ground belonging to the Commissioners of Chelsea Hospital, and which, both for situation and extent, could not be improved upon in this vast metropolis. Our College will be nearly double the size of the largest Institutions in this country, and whilst we do not intend to cover as much space as that occupied by the Colleges of Alfort or Berlin, as our students do not live within the College walls, we shall have better accommodation than in any other establishment in existence for educational and all practical purposes.

It is too long for a country such as our own to have lagged behind

other countries, both as to the extent and character of its Veterinary Colleges. With your aid, with adequate public support, we shall strive to have in London something better than elsewhere. Until all is done as well as it can be done, I trust we shall not rest.

I shall not detain you with any special remarks as to the curriculum of study to be carried out in this College, with the exception of referring to the opening of an Agricultural Course, which fits in much better with a Veterinary College than with a University as in Edinburgh. Professor Coleman is so well known to the farmers of England, that I need not expatiate on his merits. I trust that in time we shall have a large body of young agriculturists trained to know how Veterinarians can aid them, and who can appreciate the value of foresight in such matters as disease prevention.

To those who enter the College for the purpose of prosecuting the veterinary art as an independent profession, I have only to say that they have chosen a calling of the greatest difficulty and importance. It affords the greatest scope for the best minds and the most willing students. The times are critical, and the public eye upon us; what we have to rely on to extricate us from many a dilemma is knowledge. Sometimes, as in the present instance, in relation to the cattle plague, our hands are tied by routine and prejudice. Those are listened to who have always been on the wrong scent, but as a rule you will find that the secret of success in life admits of curt expressions in two words—science and industry.

Veterinary Records.—Myelitis—Ænonitis—in a Mare. By GEORGE ARMATAGE, Prof. Vet. Mat. Med. in the Albert Veterinary College, London.

MY attention was directed to a young mare, on Sunday, the 16th of April last, by a friend to whom the animal had been submitted for an examination and opinion, as the case possessed remarkable features. It may add to the interest of the reader by entering into the particulars of the history of the animal from the first.

The earliest accounts we have of her are, that while yet only a little over a year old, she was in the hands of a butcher at Framwellgate, near Durham, who stated he bred her from a half-bred mare of the Cleveland stamp, by a horse of a similar make, with a degree of blood on his side. There was every indication of the development of great strength in the animal, being possessed of well-formed parts—in fact, unusually so for one her age, the only apparent defect in conformation being in the heavy head and jaws.

At the time above-named, the owner was frequently observed driving from Newcastle market to his home, a distance of twelve miles, at a most unwarrantable speed—in fact, the young creature was looked

upon by all as a prodigy—and, like too many of his class, often found stopping a length of time at a public-house on the way, leaving the mare, covered with perspiration, standing harnassed to the vehicle at the door.

About December last signs of dulness came on, with tendency to hang the head, &c., for which Mr G. Farrow, M.R.C.V.S., Durham, prescribed. These symptoms shortly disappeared, but for a time only, when dropping of one ear and eyelid, with hanging of the lip, was observed. Blisters on the poll, and laxative medicines were prescribed in this instance, and produced slight relief.

Matters went on thus, and the owner began to feel disconcerted, and at the usual March fair at Durham she was exposed for sale.

Another butcher, living near me, who had entertained a great desire to possess the mare—but knowing nothing of her ailment—proceeded to Durham on the information that the owner had her for sale. The animal, however, had been disposed of to a horse-coper, and from him my neighbour purchased her. A few days after the symptoms made their appearance, and a friend was consulted. Little satisfaction was gained by the purchase of an animal, which had once appeared so promising; treatment afforded no relief. When used in the cart great danger was apprehended, and at length she was turned aside loose in a stable.

At the time I saw her first, on the date named above, and a little more than a fortnight after the purchase, the symptoms were aggravated, and somewhat as follows :—

The mare was standing reversed in the stall, exhibiting signs of great uneasiness, loins arched, and stiffness of all the extremities, flanks tucked up, and covered with perspiration. Pulse 96, and oppressed. Mucous membranes injected, respiration regular, but long and louder than normal. Urine and fœces had been passed without difficulty during the day and preceding night.

As she stands she trembles much, and scrapes with alternate fore-feet, and afterwards turns round repeatedly in the stall, but with very great difficulty, as nearly in a circle as circumstances will admit, exhibiting every likelihood of a fall to the ground. Breathing is excited, and becomes stetorous, but is described as not being so bad during these paroxysms as it occurred a few days ago. The eyes are bright and glistening, and ears appear to be active; but when examined carefully, and especially when she stands for a few seconds, the eyelid, ear, and lip of the left side hangs pendulous, the former giving the appearance of sleep. As soon, however, as the usual gyrations are again commenced, muscular action takes place, and they are moved spasmodically, but not freely.

The attendant excitement is evidently increasing, together with the great tendency to fall; the feet are raised inordinately high when she moves, there is no proper control over their action, and she reels very much.

A small quantity of dung was passed in my presence, and I noticed

the tail was not raised much, and the fœcal matter was evacuated in almost a passive manner.

On pinching or pricking the skin, there was only slight evidence of pain; the insensibility in the hinder quarters was even more intense.

In an hour she had fallen, and was unable to rise. I destroyed her by taking up the carotid artery of the right side.

Post-mortem examination, Monday evening, 17th April, at 5 P.M.

The animal had bled well, as evinced by the pale condition of the muscles of the trunk, limbs, &c.

The liver was the only diseased portion within the abdomen. It was of a pale drab colour, easily torn, and contained no secretion or blood. Upon the posterior surface of the *lobus spigelii* was an emphysematous swelling about the size of a crown piece in area, and raised in the form of a half sphere to the extent of one and a half inches. The substance of the gland was soft and pasty, and of the same colour as the outer side. Structure throughout irrecognisable.

The heart weighed near eight pounds. The auricles, especially that on the right side, were extremely thin and membranous in several places; the finger inserted beneath could be plainly seen from the upper side.

The right ventricle was greatly dilated and flabby. Water poured down the pulmonary artery, entered the right ventricle without the least opposition. Water poured down the aorta did not descend into the left ventricle without obstruction, but eventually did so, although very slowly.

The auriculo-venticular and semilunar valves were dark coloured, and thickened, being semi-opaque. Small shreds of reddened fibrine were scattered over the inner surface of the ventricles, adhering to the chordœ, tendinœ, and valves. Symptoms of blood changes were present in the shape of black patches beneath the endocardium, within and outside the organ. In other respects the animal appeared beautifully healthy.

The spinal chord was exposed throughout its entire length, the whole chain of bones being softened, infiltrated, and of a deep red colour from the presence of blood within the cancellated structure. In almost every part the chord was surrounded by fat, some portions of which were of a bright yellow colour, and in others darker, with a tinge of red. Over the points of origin of the first and second dorsal nerves was a great accumulation of fat, the nerves themselves being of a dirty violet colour for some distance. From this part towards the head the chord was enlarged in places, the dura mater being united to it by adventitious matter thrown out from the arachnoid membrane.

In no portion, however, did the chord fill the canal; it exhibited enlargements here and there, with constrictions, as if a sharp thread had been tightly tied round it, and altogether atrophied, the membranes surrounding it being filled by a thin reddish-looking fluid,

particularly in the mid-cervical and lunbar regions. Blood vessels throughout conjested.

The brain was conjested on the supra-lateral parts of each hemisphere, and also over the base. The lateral ventricles were normal. The third ventricle contained a moderate quantity of transparent colourless fluid; the fourth was nearly filled.

A stiff creamy-looking matter was deposited thickly on the upper side of the medulla oblongata, covering the posterior surface of the cerebellum to the extent of three-eighths of an inch forwards and upwards, and extending downwards on each side along the base of the brain, as far as the optic nerves. The depressions which separate the various objects recognised in this locality were completely filled by it, particularly the tuber cinerium and posterior perforated space, and also round the origin of the second, third, fourth, and fifth pairs of nerves. It extended also backwards on the medulla to the extent of two inches; here it was thick and creamy.

The substance of the brain proper, and also cerebellum, appeared perfectly well developed and healthy.

General Remarks.—We need not be at any loss how to account for the disease in the subject of the above notice. Work, irregular in its imposition, and uncertain in its duration, produces effects of the most pernicious nature, even in seasoned animals, and will recur with double effect on the young and immature. At times the animal was employed for carting work, drawing stones, &c., for builders, material for the repair of roads, or coals from the neighbouring collieries; and at others, as we have seen, doing her fourteen miles an hour, with three or four roystering fellows in a heavy vehicle, which is erroneously called a "light" cart. At twelve months old the bit was put into her mouth, and in three weeks, or thereabouts, put to work as we have described, being considered fully broken in, and possessing a very docile spirit, soon was denominated a favourite; but taking into account the treatment inflicted, I cannot for my part understand the term.

Throughout the succeeding twelve or fourteen months this treatment was regularly imposed, and was considered to be a promising specimen of greater speed and bodily strength. From the mode of usage employed, several attacks of influenza supervened, which in each, save one, domestic treatment was allowed to suffice. There may have existed an inherent predisposition towards the cerebral and meningeal affection by natural capacity and other causes, depending upon an unusual heaviness and unsymmetrical form of the head and upper part of the neck, which would favour the existence or prolong action of disease in the locality. The appetite was stated to be always "first rate," and taking into account the ignorance which prevails as to the recognition of a healthy consumption and a ravenous craving, we may not inaptly conclude that evidences are not wanting to establish the fact that the desire for food was inordinate. The

last owner stated she was always ready for food, and "would eat anything." The attacks of influenza also are stated to have generally affected the head, the prevailing symptoms being dulness, prostration, and tendency to coma, with sore throat, &c.

The most rational conclusions to be arrived at in the case are also materially assisted by the knowledge that the creature was only a little over two years old when an end was put to her existence.

Disease in the Feet. By ALFRED J. OWLES, Veterinary Surgeon, First Class, General Staff.

DIMINUTION of size and alteration in the form of bones are not always attended with diseased structure; the lower jaw of the horse changes greatly in both respects as age advances, but no one thinks of calling that a diseased condition. In like manner, the coffin and navicular bones are frequently altered in outline, and whenever contraction of the hoof exists, the pedal bone is wasted in substance also; in fact, a relative alteration of position takes place in the bones of the extrimities as work and age tell upon them. This is gradual and progressive, but quickest in the lower parts of the legs and feet. Still an animal cannot be called a diseased one because he is "worn," whereas any of the bones or other tissues may suddenly become really diseased, although not any of the above changes had perceptibly commenced in them. I do not infer from this that a wasted condition, and a relative alteration in the position of bones to each other, are not predisposing causes to structural disease, but, in themselves, these changes do not constitute disease, such as produces lameness; of course I except malformations. Many horses with contracted feet go sound all their lives, notwithstanding a considerable wasting of the pedal bone exists; on the other hand, disease of the tissues, within the hoof, may occur suddenly in parts previously natural in every respect so far as man can detect. Tendons, bones, ligaments, and synovial membranes are liable to sudden injuries from sprains, &c., which produce lameness in any and every part of the extremities. The navicular bursa is no exception to this rule, and disease frequently exists in the structures forming this joint prior to any of the changes alluded to above.

Perhaps a brief description of a fracture at the anterior margin of the navicular bone, and of ossification of the interosseous ligament of the opposite foot, near to its insertion into the navicular bone, may prove interesting to some readers, and, it is possible, tend to excite a spirit of research in this direction also. The specimens were taken from the feet of a horse eighteen years old, which had been carrying nearly eighteen stone within a short time of his death. This horse, I am assured, was never lame in his feet; they were somewhat con-

tracted, however. Both navicular bones are large and strong looking, and each had, when fresh, a well marked sulcus on the inferior ridge (similar to the sulci found in the astragalus); the fibro cartilage and its lining synovial membrane appeared healthy. I cannot regard the sulci otherwise than as their normal condition, although an unusual one in these articulations. One of the bones at its anterior margin had a fractured piece of bone adhering to it, mainly by the articular fibro-cartilage, which appeared quite healthy over the seat of fracture, and elsewhere; the free edge of the fractured piece projected beyond the natural outline of the bone, and had the ligament inserted into it; this bulging did not appear to be due to displacement, but rather to a growth of bone, commencing in a point of ossification in the ligament, near to its attachment into the navicular bone, into which the ossification extended; the exostosis thus formed constitutes the main portion of the fractured piece of bone. The other bone has no fracture, but ossific deposit had commenced in the interosseous ligament, at the spot corresponding with the seat of fracture in the other foot, and would doubtless have ended in an exostosis at the margin of this bone also, as it had extended to the insertion of the ligament into it, although the conversion into bone was not yet complete. An ordinary fracture of the navicular bone results from ulceration and wasting of the bone itself; the one just described evidently arose from ossification of a portion of the anterior ligament, rather than from a change in the bone—query: Were the fractures described in your Journal for May last of the same nature? I am not prepared to state the precise way that ossification of the ligament at this point leads to a fracture at or near its junction in the navicular bone, but that it is a condition sometimes found, I have the proof, and that it may occur without producing any great disturbance, the account given above of the horse also establishes. Facts cannot be upset by theory. The latter I will leave for the present.

Laceration of the Parotidean Region, penetrating to the Pharynx. By D. MacGregor, Esq., Veterinary Surgeon, Seaton, Delaval.

From the peculiarity of the following case, I presume to think it may be of interest to some of your readers.

On December 5, 1864, I was called to see a gray horse said to be affected with colic. The animal worked in a coal mine, the stables of which were a mile and a half from the shaft. On reaching the stable I was surprised to find my patient bleeding from the left nostril, and a large wound visible on the left side of the head, situate on the parotic gland, midway between the base of the ear and the angle of the lower jaw. On making inquiries about this injury, I learnt from one

of the workmen that the animal, being seized with "gripes" whilst at work, began to roll about with its harness on; in his struggles one of the hame sticks penetrated the head.

On his rising his violence increased, and the man above-mentioned, on taking hold of his head, observed the hame sticking into his head, So fast in was the iron that the man had to exert himself considerably to withdraw it. I was shown the hame, which is of solid iron, with a small hook at the end. The overman of the pit, who was present, told me that this ugly implement had penetrated seven inches, he having measured it with his tape line. Any doubts I might have had as to the veracity of the statement were dispelled by my own inspection, for the hame was covered for between six and seven inches. On carefully exploring the wound with a probe, I found that it took an oblique direction from above downwards and forwards, lacerating in its course the parotid gland, the internal masseter muscle, &c., and penetrating, I should think, to the posterior nares.

How the numerous and important blood-vessels and nerves escaped is a miracle; that they did so, however, is evident from the comparatively slight hemorrhage, and the ultimate recovery of the animal. Promising to see him next day, I left, having given him a dose of medicine, cleansed the wound with warm water, and ordered sloppy diet.

Dec. 6.—On visiting the animal to-day found him very feverish, pulse 80, breathing accelerated, skin hot, ears and extremities cold. I therefore bled him to the extent of four quarts. Wishing to see how he swallowed, I had some water given him, when, to my chagrin, at every mouthful he took the larger portion was ejected, not only through both nostrils, but through the wound over the parotid. The jet from this wound was mingled with saliva. Ordered a continuation of sloppy food, as bran mashes, flour gruel, and linseed, also kept a man using continual fomentations.

Dec. 7.—To-day he appeared much better, had eaten his mash pretty well. In the evening he was drawn from the pit, (owing to unavoidable circumstances I could not get him out sooner,) and placed in a loose box. In a short time he showed symptoms of pain in the head, with nose protruded; he wandered about the box in a restless, unsettled manner, now and then shaking his head. I had the fomentations continued, and gave an opiate to allay the pain. In this state he continued for four or five days, during which time I continued the same treatment as above, nursing the animal as much as possible with nutritious drinks. After this all the bad symptoms left him, save that he could not masticate hay or corn, which state of affairs lasted for nearly a month. He was kept alive on mashes, &c. The wound was, however, very troublesome, as the food worked its way into it, and thus produced, with the aid of the saliva, a fistula. I had this fistula cleansed frequently by injecting warm water into it, and, strange to say, the injections always passed into the nasal chambers, and out by the nostrils, showing a direct communication had been

established. The animal, at about the end of a month from receiving the injury, could again eat hay pretty well. The food did not now pass out through the wound, but the saliva did, and I was much afraid that he would have a permanent fistula. However, I determined upon trying the actual cautery, which I applied to the external opening, and was rewarded by effectually closing it on the third application.

THE SOCIAL SCIENCE CONGRESS.

THE business of the various departments of this Congress was resumed on Saturday morning. One of the most interesting papers was read in the department of Health, by Professor Gamgee.

Dr LANKESTER, the chairman of this department, briefly introduced the Professor by referring to the importance of the subject with which the paper dealt.

Professor GAMGEE said, there are probably not a few here assembled who will participate in the feeling expressed by the learned chairman of the public health section of this association, that the present meeting should not be permitted to disperse without special reference to, and some discussion on, that all-absorbing topic—the Russian cattle plague. This most malignant of all fevers is one of the indigenous maladies of the East. From time to time, during centuries past, it has lurked in the Asiatic and European steppes, killing slowly the rude gray oxen of the Russians, and exterminating the cattle of districts and countries to which it is usually foreign. There is some ground for the belief that the pure breed of Eastern plains enjoys some immunity against the disease, and it is not a little owing to the frequent mildness of its attacks in the herds of the Cossack and the Tartar that renders not only possible, but tolerably easy, the conveyance of infected herds from their original homes to parts where their introduction may lead to widespread mortality and famine. Not unfrequently the active agents in the propagation of the plague have been droves of sick oxen dying on the roadside, and otherwise indicating their real and very dangerous condition. Such, indeed, was the case during outbreaks noted in history, and which occurred in the 13th, 17th, 18th, and the present centuries. The campaigns of the First Napoleon in Central and Eastern Europe are memorable for the facilities they afforded, owing to the active movements of prodigious forces engaged in war, for the dissemination of the cattle plague over the greater part of the European continent. With imperfect means of transport, the presence of large armies in hostile countries, it was often necessary to provide thousands of oxen for the transport service, and the supply of animal food for the soldiers. The system of trading and intermingling of stock thus fostered could not fail to afford the best chances for the propagation of

contagious disorders; and, all absorbed with means of offence or defence in relation to each other, the people of various countries had little chance of adopting rational and efficient means whereby to arrest the progress of the Rinderpest. The battle of Waterloo not only sealed Napoleon's fate, but amongst the unknown blessings it bestowed on us was protection from this dreaded pestilence. A long period of peace resulted in the promotion of agriculture as of other useful arts. Governments fostered measures which might in ordinary times protect countries from bovine epizootics, and the disease which in 1814 swept away the herds of Germany, Switzerland, and France, fell back into its old haunts, and has committed less havoc since. The remarkable outbreaks of 1830, 1841, 1844, 1849, 1857, and 1863, wide in their distribution as they no doubt were, could not be compared to some of the older ones; and instead of following the cannon's roar, they appeared silently on the great roads of commerce, and mostly in a direction from east to south-west, into Egypt or across Turkey and Hungary, as far even as the Pontifical States. The periodic extensions of the malady in the lines of communication established by trade led to our attention being forcibly directed to the subject, as the importation of foreign stock increased in this country. We knew that so soon as any direct communication was established by cattle-dealers between Russia and England, the murrain of the steppes could not fail to be imported. This opinion we expressed repeatedly, and even indicated that the malady would reach us through the Baltic. All we wanted was, that any cargo of cattle direct from Russia should be subjected here to regulations such as those which are in force in Austria and Prussia; but we were freely told that, until the cattle plague came, no one would be convinced of the importance of, or necessity for, such measures. The cattle plague has come; it has reached us through the Baltic; and though we may return the compliment to the Russians if they now want breeding stock, it is evident that ere this the ports should have been closed to direct importations from Russia, even though we were only shutting the door after the steed was stolen. There is much reason for regret that the public press in this country has in too many instances attempted to throw discredit on those who have insisted on the truth that the plague now destroying our cattle is, and only could be, an importation from Russia. As we are compelled to trace plagues in men and animals to their origin, if we wish to devise means for their prevention, it is evident that in relation to the present outbreak it was necessary to ascertain all we could as to its cause. To those who have studied the cattle plague in times past—to those who have fathomed the literature of the subject, and not only seen the disease abroad, but mingled with men who have had the greatest amount of experience respecting it—no other view could possibly meet with favour but that which ascribed the malady to direct or indirect importation from Russia. It is certain that to the west of the Czar's dominions the plague never originates spontane-

ously. That is a truth as much established in the minds of scientific men as the preservative influence of vaccination against small-pox in man, or the purely contagious character of the sheep-pox. When I first saw the steppe murrain amongst the cows of the London sheds, on the 29th of July, I knew that the disease must have been imported. On making inquiries, we found that a cargo of Russian cattle and sheep had been brought from Revel to Hull. It was the first cargo that had yet come direct to us from a Russian port; and fourteen days after a portion of that cargo was first exposed in the Metropolitan Cattle Market the strange disease was seen in Copenhagen-fields. This fact alone was startling, and satisfactory enough. The result bore out the predictions that had repeatedly been made, and we proceeded somewhat further to strengthen our belief in the fact that the disease really came through the Baltic. An agricultural society in Esthonia had agreed to supply a certain number of cattle and sheep, free, on board a steamer at Revel. That society had insuperable difficulties in fulfilling its contract, from the scarcity of oxen fit for the London market. The terms of agreement with the London salesmen were that the animals were to be supplied free on board fit for the London trade, but many of the cattle did not come up to the proper standard of weight and fatness. The number supplied was short, and 46 animals were obtained from St Petersburg to make up the cargo; but their condition was so bad that only thirteen of them were chosen by the person representing the London importers. Of all the cattle brought to Revel to be shipped for London, three had to be slaughtered diseased by a butcher; a fourth died in the yard before being delivered on board, and an action was brought against the English agent for the price of this animal, which he would not, and did not pay. A fifth animal showed signs of illness on the passage, and when the cargo arrived off a Danish port, a letter was sent from the London salesmen intimating that "the things," meaning the cattle, should be taken to Lowestoft, instead of London, so as to avoid the doctors. For some reason or other, they were afterwards landed still farther from London, at the port of Hull, and there subdivided for sale at different markets. One half left Hull for London at once, and that half propagated the disease. Why the other half did not do so is of no importance to us, as we constantly find, in tracing contageous diseases amongst cattle, that, two farmers having bought a herd between them, the one half purchased by one man remains in health, and the other half dies. The cattle sent to London stood the London market on the 1st of June, and some of them were exposed again afterwards for sale. They must have communicated the disease to foreign cows near them, for it was these cows which conveyed the malady into the London sheds. On the 24th and 27th of June the plague was already raging in different dairies, and since then it has been widely disseminated. I am perfectly satisfied of the evidence at my disposal on this question, and some of which I need not enter further on this occasion; but it may probably be thought that our

Government should have caused inquiries to be made as to the whole history of the cargo from Revel, and not through consuls, but through competent veterinarians and others, who could be trusted to sift the question thoroughly. The chance has been allowed to slip, as the Esthonians are now not likely to divulge what might injure their prospects of trade in future, and interested parties have taken proper precautions to place people on their guard. For me the strong points in the case are: Firstly, the previous knowledge of the fact that the disease could only reach us through the Baltic; secondly, the fact that the cargo imported last May were the first direct from Russia; thirdly, the slaughter and death of cattle at Revel, and the sickness of an animal on board the ship; fourthly, taking the animals to a port distant from London, so as to avoid the doctors; fifthly and lastly, the manifestations of the plague just after the animals had been exposed in the Metropolitan Market. I have thought it proper to enter at length into this statement, as there are many people who have been seriously misled by the fancies and suppositions of those whose knowledge of the cattle plague is of the most superficial description. Some may still think we are too positive in our assertions on this point; and there are those who charge us with want of modesty for openly asserting what we believe to be the truth in relation to the origin, progress, and prevention of the cattle plague. Unfortunately, we well know that veterinary science in this country has been most imperfectly taught and studied. We are free to admit that on a host of subjects there is occasion for deep regret that so little has been learned, and we are conscious of the fact that extraordinary efforts are required to raise the status and improve the knowledge of the veterinarian. But we are asked to confess ignorance on the disease now ravaging our herds. We are told "that there is no existing disease respecting which medical men would dogmatise so unhesitatingly as the veterinary surgeons have done respecting the cattle plague;" and we are told "that the doctors are looked up to because they have done good work, because they have diminished the fatality of our human diseases, and are daily at least endeavouring to acquire new victories over nature." Now, gentlemen, at the risk of being deemed ostentatious, I repeat that the ignorance has existed on the part of those who have done all they could to weaken our influence in the eyes of the world. There is scarcely a medical subject on which you would engage to find a hundred of the best men that can be had unanimous in their opinion; but we have had congresses with nearly 200 of the most learned veterinarians in Europe, where, on the subject of the steppe murrain, no difference of opinion could be said to exist. It might be positive assertion, it might be dogmatism, that the disease was incurable, that it was also propagated by contagion, and that to diminish its ravages we must slaughter the sick and infected; but the verdict of the best men in the world, medical and veterinary, is unanimous on these points. That verdict is as unanimous as any conclusion would be at a meeting of doctors if the subject of human small-pox

was broached, and the invariable origin of this disease in contagion, and its prevention by vaccination, were discussed. As Professor Seifmann justly observes in his report, just published, if we could cure the cattle plague it is doubtful whether we should venture to do so, considering the danger of thereby keeping up many sources of contagion. As to the curability of the disease we have had some experience during the present outbreak. A small proportion of the animals subjected to medical treatment have recovered. We have treated many, and left many to take their chance. The result proves that those left to themselves have done as well as those that have been treated with all the remedies suggested from the commencement. The chance of cure depends altogether on the severity of the attack; and whenever attempts have been made to follow up a considerable number of cases, and treat them carefully, the result has been a mortality varying from 85 to 95 per cent. It is not astonishing that cures have been advertised, and wonderful results announced. The recovery of one or two apparently desperate cases encourages experiments as to treatment; but, so far as our experience has gone, the prosecution of trials has resulted in loss and disappointment. From the commencement of the outbreak one of my principal objects has been to discover how we might determine before ordinary observers that an animal had the disease. If remedies can be found to prove of service, they must be applied before the changes of structure are so far advanced as to render it impossible to restore health. So far as my observations now extend, I believe that from twenty-four to forty-eight hours before any very obvious signs of ill-health, such as dullness, loss of appetite, &c., are observed, it is possible to indicate that animals are under the influence of the malady. I have no great hopes of success from treatment even at this early stage; but all will admit that it is something to have ascertained how, at the earliest possible moment, sick cattle may be distinguished from diseased. Before entering on the proposals made for the prevention of the cattle plague, I may be permitted to allude to the contrast offered between veterinarians and doctors, by which it is implied that we have done nothing to acquire new victories over nature. On former occasions reference has justly been made to the manner in which, under a proper organisation, no less deadly disease than glanders in horses has been well-nigh banished from our cavalry stables. This has been a victory over nature, but it has been due to the early slaughter of sick and infected animals. When small-pox ravaged our flocks in 1862, treatment, inoculation, and vaccination, were resorted to, until I called the farmers together, and told them how to kill out the disease. In three weeks the malady was stopped. This year the small-pox broke out in Sussex; and as the disease was no less imported than the steppe murrain, the early slaughter of diseased animals at once extinguished every trace of the pest. Having ascertained that it was the true Russian plague which had reached these islands, we hesitated not to advocate the means found most efficient abroad of preventing con-

tagion and killing the sick. We were at once met by doubts expressed as to the origin of the malady, and assertions stated as to its dependence on conditions of the atmosphere. Government said it lacked powers to control the progress of the malady, and I suggested the formation of a national association for the prevention of cattle diseases. At once steps were taken to diffuse useful information on the disease, and call upon civic authorities, railway and steamboat companies, &c., to aid. Local insurance societies soon came into favour. I attended various country meetings to show the fallacies of local associations, and the justice of my remarks has been amply vindicated by the letter from Sir James Kay Shuttleworth in the *Times* of the 5th instant. A fortnight back, at Northampton, I spoke of the importance of a Government cattle insurance system. From the commencement I have been opposed to any indemnity from the public purse, and it has been my endeavour to show that, if Government were properly guided in this matter, it could meet the difficulties of the case, and secure control over stock for the effectual suppression of so virulent a malady as the one now raging. It is true that there are other measures to be adopted, and gross abuses to be corrected. The one measure not to be advocated is diverting the energies of veterinarians to the cure of the disease. Adopt this course, and there is an end to any proper action whereby the plague may be banished from Great Britain. Turn to the written histories of typhus and yellow fever, of human small-pox and cholera, and tell us what has been done by curative means. The doctors who have gained victories over nature have gained no victories over these maladies but by the adoption of preventive measures. Animals can be dealt with differently to men, and a hundred outbreaks of cattle plague might be quoted to prove that to kill is to save the lives of thousands and tens of thousands. To spare the knife implies propagating and perpetuating the malady.

Dr RAWLINSON thought the disease had been brought here through our commercial relations. He was sorry to say that farmers displayed an utter want of attention with regard to sanitary arrangements for their cattle. It was said that the knife was the only remedy, but he thought this could hardly be the only one.

Mr P. HOLLAND considered that the disease was propagated both by contagion and atmospheric causes. Whether to kill was the only safe remedy or not, he believed that it was the safest. He considered the cattle disease was a typhus fever of a very rapid kind.

Dr LANKESTER said that the evidence of the plague having been brought over from the Continent was unimpeachable. He denied that there was any power in dirt or filth to produce the disease, or we should always have had it. If cleanliness could have saved cattle, the precautions taken on the farm of Earl Granville would have done so. They knew very well that such was not the case.

The discussion was continued by some other gentlemen, but no very practical observations were made.

THE SOCIAL SCIENCE CONGRESS.

THERE was a large attendance of the members of the Congress at the Music Hall, Surrey Street, Sheffield, on Monday morning, Oct. 9, to hear an address by Dr Lankester, President of the Health Department.

Dr LANKESTER, after some general remarks respecting public health, alluded to the ravages of cholera on the Continent, and the prevalence of the cattle plague in England. In anticipation, he said, of the one plague, and the actual presence of the other, there is enough to excite the keenest interest of all, and to induce the most anxious inquiries as to the causes of these diseases, and the best means of arresting their progress. I will not attempt to settle the question whether these diseases are contagious or not; whether they arise from a special poison which is propagated in one body and is conveyed to another, or whether there are certain general conditions of external agents which engender poisons capable of spontaneously producing them. I need but thus generally to refer to the fact of a difference of opinion, to remind you, that amongst our sanitary reformers there are two great schools, one of which maintains that the great mass of zymotic diseases are produced by special poisons, and are called contagionists; whilst another school do not believe in the existence of special poisons, but believe that certain general conditions of sanitary neglect and dirt are alone necessary to produce the group of zymotic diseases, and they are called anti-contagionists. I believe that the extreme views of either school are wrong, and I have a very deep impression that for sanitary measures to be directed by one or other party in the present state of our knowledge of the diseases would be to plunge us into worse evils than quiet submission to their unresisted influence. But whilst all are agreed that small-pox is a contagious disease, and bronchitis is not, there is a large class of diseases on which sanitary authorities differ as to their nature, and the best modes of arresting their development. It is of the highest importance that we should pursue an inquiry into the origin and nature of those zymotic or pneumatic diseases which carry off annually upwards of a hundred thousand of our population. In order to do this, I think there are three circumstances that demand our attention: first, the poison that is supposed to kindle the disease; secondly, the medium that conveys it; thirdly, the person predisposed to take the disease. If we lose sight of any one of these elements in investigating zymotic diseases, we shall most assuredly get wrong, and practically commit great mistakes. With regard to poisons, even the anti-contagionists admit that in what they call miasmatic diseases, conglomerations of dirt and filth, or matters in their wrong places, do get into the system, and, at one time or another, do upset and damage the healthy working of the machinery. There can be no doubt that certain inorganic agencies, such as carbonic acid, sulphuretted, phosphuretted, and carbonetted hydrogens, ammonia, and sulpho-cyanogen, do produce injurious effects upon the system. Continued exposure to such exhalations may prevent a proper oxidation of the tissues, and render it predisposed to take in the diseases of special poisons; but we have no evidence to show that any of these agents, although they will destroy life, are capable of producing alone any of the forms of miasmatic disease. It seems demonstrated that there arise during the decomposition of vegetable and animal matters certain organic molecules which, being taken into the system, will produce certain definite changes in the system, constituting well-known forms of disease. Up to the present time we have no exclusive experiment with regard to the origin of any of the specific contagious diseases. There is no error perhaps of more vital importance to the public health than that which was fallen into by some of our early sanitary reformers—a belief in the spontaneous origin of the several forms of diseases produced by specific contagions. The most common forms of contagious diseases in this country are small-pox, scarlet fever, measles, whooping-cough, typhus fever, typhoid fever, and our occasional visitant Asiatic cholera. No one, that I am aware, has yet isolated the poison of scarlet fever, of measles, of typhus, of cholera, and of the other diseases of the group of contagious diseases; but, reasoning from analogy, we are driven to the conclusion that these diseases depend on a cause similar to that of small-pox, and that the real form of the poison is the charged white cell of the blood. We are not aware that the poisons of small-pox, measles, scarlet fever, or typhus are conveyed by any means but through air, whilst there is every reason to believe that the poisons of typhoid fever and cholera are conveyed by the agency of water. A question of high interest arises, and it is one that has not at present been settled, and that is, as to whether the poison matter of these diseases is capable of

multiplying itself by cell-division, or the ordinary forms of the growth of fluvial matter out of the body. It does not seem impossible that this should be the case, although at present we have no demonstration of the fact. Another interesting question connected with these poisons is the possibility of transformation or development. Let me say a few words with regard to the means of conveyance of poisons. The most obvious are the atmosphere and water. The air, to carry most poisons, must be warm and moist. The poison of yellow fever spreads in hot climates; the poison of typhus is arrested by heat on the one side and cold on the other. At the temperature of boiling water all these poisons are destroyed—a most important fact, as we have in every household in Europe the means of destroying them. But there are other means of conveyance besides air and water. Articles of food, articles of wearing apparel, bedclothes, curtains, carpets, and all vessels and depositories, containing the secretions of human beings, may retain the poison cells in all their integrity. These things may carry the poisons from household to household, disseminate them in our streets, our omnibuses, our railways, steamships, and public conveyances of all kinds. They may be shut up in drawers or in old closets, (of which there are many striking instances on record,) and, at any moment when brought into contact with the human system, they may start into life and activity again, to renew their ravages on systems predisposed to their action. We know something of the laws of predisposition to disease. We know, for instance, that persons who have had the small-pox are not disposed to take it again. We know that in nine cases out of ten if persons have been vaccinated they will not take small-pox. This is one of the great triumphs of our modern civilisation. It is the beacon of our hopes with regard to crushing out for ever the poisons that can only be propagated in human systems. But our knowledge of predisposition extends further than this. We know that where the four great factors of our life have been scantily supplied, or vitiated, there predisposition not only to idiopathic and self-generated disease exists, but to receive the germs of the poison fevers, of which I have been speaking. What is true of human diseases is also true of those of the lower animals which man associates with himself. The horse, the ox, the sheep, and the pig are all liable to idiopathic and contagious diseases. Like human diseases, many of them are *sui generis*, and incommunicable to man. The sheep of our country have just passed through a "great epidemic of small pox." It had all the peculiarities of the small-pox in man, but it was not capable of extension to man. At the present moment a more frightful scourge is visiting our cows, drying up one of the great sources of the food of our infant population, and rendering scarce the animal food so necessary to the health and strength of the working man. Warning voices have not been wanting on this matter, and we are especially indebted to Professor Gamgee for having pointed out years ago the danger we were incurring in not taking steps for the prevention of the introduction of this terrible disease. That it spreads and behaves itself as a contagious disease, I have had the opportunity of observing in the parishes of Hampstead and Hendon. Studying this disease from the threefold point of view of its poison, the means of its communication, and the predisposition of its victims, we are struck at once with the fact that it is not the calves or the bullocks, or barren cows, that are attacked, but it is the milch cows. We cannot fail to see a cause of this predisposition in the comparatively unnatural condition in which the milch cow is kept for the purpose of obtaining from her milk all the year round, that gives to her, beyond all her congeners, the tendency to take this disease. In such facts as this we may see, beyond the law which devastates our flocks, a law maintaining the integrity and strength of the species by the letting loose of poisons to destroy the weak and those which are likely to produce an enfeebled race. Nay, even further, is not this the great lesson that we should learn from the epidemic attacks of these poison fevers —are they not sent to take from us the constitutionally weak and feeble, so that the race may retain its reign upon the earth? Our subject here very appropriately divides itself into two heads—public action and private action. It is the duty of the civil government, in matters of life and health, to do for the individual what he cannot do for himself, and it is the duty of individuals to do for themselves what the government cannot be expected to do for them. My conviction is, that our legislature wants earnestness. All our acts are so constituted that they may be defied with impunity. They, in fact, give the power of action or inaction to those who are either interested in maintaining sanitary abuses, or are ignorant of the dangers which arise from their toleration. The Metropolitan Management Act was undoubtedly the largest instalment that legislature ever made towards correcting the sanitary abuses of London, and in the creation of the office of medical officer of

health, it has laid the foundation of future sanitary legislation. The great bar to sanitary action in our vestries and local boards is their parsimony; and if they could be once made to see that disease and death are the most costly luxuries in which man can indulge, they would possibly give more scope to the action of their medical officers of health. Perhaps one of the greatest improvements that could take place in the London system would be the appointment of the medical officers of health for life, and reducing their numbers, giving them larger districts to superintend, and appending salaries which would render it unnecessary that they should attend to private practice. The address of Dr Lankester was listened to with the greatest attention, and at the conclusion was loudly applauded.

In the department of Jurisprudence and the Amendment of the Law, Mr A. J. WILLIAMS read a paper—"Upon what principles should Local Courts be constituted, with reference to extent of jurisdiction and system of procedure?" He advocated the extension of county court jurisdiction, without the introduction of those artificial pleadings which encumbered and confused proceedings in the superior courts. No discussion followed the reading. In the same department, Mr W. J. LEPPOC read one on "Tribunals of Commerce," and Mr NOTLEY another on "Bankrupt Law Amendment."

Miss CARPENTER contributed a paper in the Educational Department on "Our Neglected and Destitute Children—are they to be educated?" The lady adverted to the increasing attention paid to education in this country. While the Council on Education aid largely in the education of the wage class, it leaves untouched the destitute and neglected children who abound in large cities, and are providing a constant supply for our workhouses, reformatories, and prisons. Miss Carpenter described numerous low districts in Bristol which abound with such children, utterly unable, from their degraded condition, to attend pay schools. She mentioned that recent statistics show that in Manchester thousands of children grow up in complete ignorance, and that in Liverpool there are annually twenty-five thousand apprehensions of persons who have no education. Ragged schools are the only ones which have attempted to reach these children, but they have proved utterly inadequate to remove the evil unaided. They have shown, however, that these children can be rescued from pauperism and crime, and made self-supporting, by being placed in proper schools. She urged an appeal to the Government on behalf of such children. One pound per annum spent for each in education would be a wise economy.

In the Department of Jurisprudence, Miss SHEDDON read a paper "On the necessity for the inviolate preservation of trial by jury on all great questions of fact." It commenced by referring to the present being a favourable opportunity of doing something to preserve and support an institution which, coming from and belonging to the people, gave them a share in the administration of justice, and which institution had been so powerfully advocated by Lord Brougham at all periods of his career, and which Lord Erskine had illustrated so pointedly when he said that the whole machinery of the English constitution culminated in the fact of bringing twelve honest men into the box. The paper then gave an historical sketch of trial by jury. It was obvious that in settling a matter of fact a competent number of sensible men of the middle class formed a more impartial source of justice than the decision of any single individual, and any attempt to establish tribunals which were unconnected with juries was a step towards the erection of an autocracy. She urged that people should cling to this institution, and while improving, if need be, the details of its working, its principle should not for a moment be abandoned; and this was the more necessary because, though there was no talk of abandoning trial by jury, very serious encroachments had been made upon it as a system by recent legislation.

Dr MILROY read a paper in the Department of Health, on "Quarantine and the Cholera, with special reference to the present epidemic in the Mediterranean," which was followed by another on the same subject by the Rev. W. H. CHANNING, of the United States Sanitary Commission. The other papers in the same department were—George L. Saunders: "The cause and the difference in the death-rate of rural and urban places, and incidentally of Sheffield." W. H. Rumsey: "Death rates and sanitary statistics." Joseph Jones: "The Local Government Act, of 1858, and the necessity of extending its usefulness to the suburbs of large towns." Stevenson Macadam, Ph. D.: "On the chemical composition of town waters, and the contamination thereof." The members interested in the Economy and Trade Department were occupied sometime in discussing the following papers:—R. Eadon Leader, B. A.: "The rise and growth of the trades of Sheffield."

H. Turner (Sheffield): "The file trade—its importance, locality, and peculiarities." Thomas Aveling: "The economical use of road locomotives, compared with horse labour." Thomas Beggs: "The home accommodation of the people in relation to their domestic and social condition, with practical suggestions as to the further development of freehold land societies and building societies." Rev. Henry Solly: "Facts and fallacies in relation to working men's clubs." Joseph Rayner: "Municipal savings' banks." Graham Gilmour: "Cheap food."

A separate section was formed for the purpose of discussing papers on building societies, savings' banks, (in Sheffield,) and the evil effect of the modern system of usury.

Contagious Typhus of Cattle.—Can the contagious typhus of the bovine race (pestis bovina of the Italians, Rinderpest of the Germans) originate spontaneously in other cattle than those belonging to the race of the Steppes? By M. RENAULT, Director of the Imperial Veterinary School of Alfort, afterwards Inspector-General of French Veterinary Schools.

OF all the maladies which can affect the bovine species, the most fatal is, without contradiction, that which the Germans and Italians have called "*peste bovine,*" and which in France we have named "*contagious typhus of large cattle.*"

The name of pest, which has been given to it in Italy and in Germany, is derived, without doubt, from this, that, like the latter scourge in the human species, it proves, in the bovine race, certainly fatal in almost every individual which it attacks, it makes frightful ravages in whatever country it penetrates, and in which it reigns for any length of time. But if notice is taken particularly of all the symptoms which characterise it, and of the seat as well as the nature of the principal lesions seen in the animals which die under it, it is justly named "*typhus,*" for it is incontestable that, although differing in some respects, it bears a close resemblance to the typhoid affections in man.

This affection is never sporadic, or, at least, if it commences by manifesting itself at once in some individuals, it is not slow, when once developed, to extend itself in a frightful manner. This propagation takes place, not on account of a particular medical constitution which prevails at the moment; not in consequence of an epizootic influence which acts in accordance with the epidemic conditions which spread the cholera and the plague, for example, but *exclusively* from a very active contagious property possessed by diseased animals, the produce of their excretions, and their remains when they are dead—a property which impregnates and may be transported by other animals, persons, and things which may have touched, or even merely approached the diseased animals, their excretions, or their remains.

Contagious typhus is a malady peculiar to the bovine species. Other species and man may then go with impunity for themselves, at least, into the most active centres of contagion.

It is also certain that although, before the 18th century, it had existed and committed great ravages in Europe and even in Western Europe, the study of this disease had scarcely commenced, and was little known until after the year 1711, the epoch of one of its most disastrous invasions. Since then it has appeared several times at intervals, unequal with regard to time and variable in duration, in different parts of the centre and west of the Continent, and each time it spread terror and desolation over the states which it visited. To explain the apprehensions which it excited, it will suffice if I recall to mind the amount of mortality which it occasioned in some of its invasions in countries more or less circumscribed, for example :—

1. From 1711 to 1714 the number of cattle which died of contagious typhus in Western Europe was 1,500,000.

2. From 1713 to 1723 there died 200,000 in Holland alone, although it was not continually nor in totality afflicted with the disease during this lapse of time.

3. During the epizootic attack of 1745 to 1749, Denmark, successively invaded in its various provinces, lost 280,000.

4. According to Paulet, in the course of that same epizootic attack, from 1740 to 1748, the loss in the west and centre of Europe alone rose to 3,000,000 of horned beasts.

5. Invaded again in 1769, Holland lost in less than three years 395,000 horned cattle.

6. In fine, reckoning up all these losses in a statistical point of view, and so put that no one need undertake a similar labour, Dr Faust was able, without causing astonishment in any one, to sum up to 200,000,000 the number of cattle carried off in Europe by the contagious typhus during the period from 1711 to 1796, the time at which that learned man left off his calculations.

I should add that, having raged in Egypt from 1841 to 1844, the disease destroyed 400,000 oxen or cows; and that in Russia alone 1,000,000 succumbed to the attack in 1844–45.

If, placing the matter in another point of view, it is sought to appreciate the degree of gravity in reckoning the number that died in proportion to the number of individuals attacked with the disease, we attain the result that, in general, a man must have considered himself very fortunate if, in one cow-house, one farm, or one infected locality, he was able, which was very rare, to save the third, or even the quarter of the diseased animals; for in ordinary circumstances, and among cattle other than those of the race of the steppes, the losses generally amounted to eighty or ninety per cent.; and it happened sometimes that there did not remain a single animal in a cow-house or even in a village wherein the disease had existed.

Very happily for her, France has not been visited by the contagious typhus since she suffered from that which was brought by the foreign armies in 1814 and 1816! And not less happily for the other states of the centre and of the west of Europe, experiments and observations made and repeated during the last thirty or forty years, on a

great scale, by Austria and Prussia, constantly exposed as they are to the scourge on their eastern frontiers, have demonstrated that, with certain measures of police, carried out with energy and severely applied, it is possible to prevent the invasion or to arrest its progress in countries where war does not present any obstacle to their rigorous enforcement.

But in order that these measures, which consist in nothing less than to compel the owners of stock to submit to the destruction of their cattle when diseased, or even only suspected—which consists, at the same time, in sequestrating for weeks the inhabitants of every farm, and even of every village, or of an entire district of country, which thus interferes with the liberties of the citizens and their rights of property; in order that such exorbitant measures, I say, may be taken authoritatively and with resolution by governments, and accepted as legitimate by those whom they affect, it is essential that they be demonstrated by evidence supported by facts which establish sufficiently their rationality, and of such a nature as to warrant the hope that they will be efficacious.

Thus it is necessary, first of all, that there should rest no doubt on the contagious nature of the disease, and of its powerlessness to propagate by other means or influence than by contagion. Now this first fact is, it may be said, definitely settled by observation, and perfectly acknowledged by science. I have not, then, to stop here.

It is requisite, then, to observe that the disease cannot be originated nor developed in the animals which we seek to preserve from the contagion, under the influence and from effect of the causes which originally produced it in those which, being the first attacked, have become the first bearers or propagators of that contagion. For if all the individuals of the bovine species were ready to contract it spontaneously, and from other causes than contagion, it may be conceived that the measures which operate against that only would not offer any sufficient guarantee against the extension of the epizootic, and that the malady could appear and propagate itself behind the obstacles that have been opposed to its progress. Of what good after that would be measures so onerous and vexatious, and which must result in pure loss?

Unfortunately, on this question, which is a fundamental one for the sanitary police of Europe, there is not the same accord as on the first. If the greater number of veterinarians regard as incontestible that contagious typhus can only be engendered *spontaneously* in oxen of the breed peculiar to the steppes of Southern Russia and of Hungary, others, among the most distinguished for their science and great practice, maintain the opinion that, under the influence of general causes which make it arise among the bovine race of the steppes, that malady may be developed in cattle of all countries.

Now, these dissensions, it is conceived, and experience besides has demonstrated this, become a cause of embarrassment and hesitation for governments who may be called upon to defend their countries

against the invasion or the progress of this terrible scourge. It is with the desire to remove all doubts on this point that I have devoted myself for several years to study it in the history and in the administrative archives of divers states of Europe, and to researches and investigations as severe as it has been possible for me, of which I am about to give here a summarised result, and which I am induced to hope, if it does not entirely settle the question, will at least contribute to give greater authority to the opinion of those who, like myself, regard the race of the steppes as the only one susceptible of spontaneously engendering contagious typhus, and other races as capable of contracting it only by contagion.

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This opinion, against which it can be said that the whole of Germany has protested with energy through its men, the best entitled to pronounce an opinion on the question—this opinion, I say, has been, not emitted for the first time, at least singularly supported, and re particularly spread abroad and accredited by the French veteri-
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It appears to me indispensable to reproduce textually in this place the passage in the work of M. Delafond, which sums up that doctrine which I believe to be erroneous and dangerous; I shall endeavour then to demonstrate on what a slight foundation it rests.

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This opinion, against which it can be said that the whole of Germany has protested with energy through its men, the best entitled to pronounce an opinion on the question—this opinion, I say, has been, if not emitted for the first time, at least singularly supported, and more particularly spread abroad and accredited by the French veterinarians from the commencement of the present century, and, strangely

enough, by those above all who have either never seen or who have only once observed, have never had the opportunity properly to study typhus. Among these I may mention D'Arboval, Rodet, Vatel, Gellé, M. Huzard, jun., and particularly M. Delafond, who, having developed in a series of articles published in the "Receuil de Médecine Veterinaire," in 1837, and who reproduced it with great assertion in a work which he published in 1838 upon "Sanitary Police Respecting Domestic Animals," and who has succeeded more than any other person, by his teaching at Alfort, by his writings, by the authority of his name, in propagating his opinions in France, and even by making them penetrate into certain parts of Central Germany, and notably in Bohemia, where it led to the loss of nearly all the bovine stock in 1844.

It appears to me indispensable to reproduce textually in this place the passage in the work of M. Delafond, which sums up that doctrine which I believe to be erroneous and dangerous; I shall endeavour then to demonstrate on what a slight foundation it rests.

"Does contagious typhus in oxen originate in Hungary as the plague in man originates in the East?" Lancisi, Leclerc, Layard, Vicq d'Azyr, Paulet, Boniva, Leroy, and Metaxa all hold this opinion. Other persons, without contesting that origin, think that that disease may spring forth spontaneously in cattle of all countries when they are exposed to the causes which lead to its development in Hungarian cattle. This opinion, put forth by MM. Rodet and D'Arboval, we share in.

"These are the causes by which the epizootic typhus is developed. In places where exist a war of some duration contagious typhus in cattle develops itself. These two destructive scourges are inseparable. It is incontestable that the typhus always accompanies great movements of troops and marches in the convoy of provision of horned beasts which follow *corps d'armée*. God is not pleased now that we make war on each other; for if unfortunately our country were one day invaded by the German, Prussian, Russian, or Dutch people, to that calamity would soon be joined another—contagious typhus among our cattle."—(Delafond, Police Sanitaire, Paris, 1838, pp. 159 *et seq.*

A little further on, in the same work, after having enumerated the causes of typhus, which, according to him, must be perfectly well known, M. Delafond reverts to the same idea, repeating in some sort the same terms:—"Behold (says he) the causes of typhus. Its origin is known; its appearance has always been coincident with the disorders brought about by war. Thus, wherever the scourge of war is carried, there the typhoid scourge declares itself."—(*Ibid*, pp. 338, 339.)

Thus following this doctrine, of which I have borrowed the formula from one of his most eminent disciples, contagious typhus in bovine cattle may have its origin in France, in Holland, in Germany, in England, &c., among the cattle of those countries; it is sufficient,

transmitted, who would give himself the trouble of seeking out what were the movements, the marches, and countermarches of our army of the Rhine at the period in question—whoever has verified, by examining the historical documents recorded, how, sometimes victorious, it passed beyond the banks of the Rhine following the Austrian army, of which it occupied the positions and followed the movements; at other times driven back by that army, it allowed it to push its reconnaissances even into our departments situated on this side of that river; from which resulted the frequent passages and sojourns either in or near the villages which they had passed and camped in with the herds of cattle which accompanied the Austrian army; whoever will not ignore that it was Hungary almost exclusively from which were drawn, and arrived the numerous herds of beasts which formed these parks, as is attested by the information which has been officially communicated to me by the Austrian administration itself; whosoever will take the trouble, as I did, can convince themselves by consulting the administrative archives of the Grand Duchy of Baden, of Wurtemberg, and Bavaria, that from 1794 to 1801 typhus, so to speak, never ceased to ravage these different states, and that it was brought and kept up either by the continual passage of troops of Hungarian cattle which traversed those countries to reach the Austrian army on the Rhine, or by the passage of troops who drove with them their infected parks; whosoever will verify, as I have done myself, the perfect exactitude of all these facts and of all these things, will become convinced that, far from proving that contagious typhus takes its origin in the cattle of our occidental countries, the epizootic typhus observed in 1796, 1797, 1798, and 1799, in our army, and in our Eastern departments, furnishes, on the contrary, another example, if such is wanted, that that malady never falls on our beasts, except they have communicated, directly or indirectly, or have been placed in connexion either with Hungarian or Russian cattle affected with the pest, or with beasts of other native breeds infected by them.

Does not this, in effect, agree with the last evidence of the preceding facts? Let us examine.

In 1793, Russia, England, and Austria coalesced against France. Austria was the first who began the campaign. One of her armies crossed the Tyrol and entered Lombardy. That was, as it has always been the case with Austrian armies, followed by a provision of Hungarian cattle. Typhus, with which these were soon infected, penetrated with the army into Lombardy.

In the following year, 1794, the Austrian army joined with the Piedmontese army in the Sardinian states. That junction was scarcely effected when the typhus broke out in the parks called provisioning parks, and then spread into the adjoining countries, and successively into different parts of Sardinia and Piedmont, where it made great ravages.

In 1795 two large Austrian armies were sent, the one into the grand duchies of Hesse, Darmstadt, and Nassau, to oppose the French

army of the Sambre and Meuse, which was commanded by Jourdan; the other to oppose that on the Rhine, under Pichegru. And thus Bavaria, Wurtemburg, and the grand duchy of Baden, which were traversed by these armies, were first and each in succession infected with typhus. Next the grand duchies of Hesse and Nassau, occupied by the Austrian troops, were infected. Then, in short, the contending armies drew near to each other, and, in consequence of the alternation of successes and reverses which marked the campaign, they were brought together and succeeded each other alternately in the same country, and thus bringing men and things of both sides in almost daily contact, the malady invaded in their turn the cattle parks of the two French armies, and from them spread among the cattle of the departments into which these two armies moved. In such circumstances, had either Jourdan or Pichegru any necessity to go into Hungary in search of beasts to introduce the typhus into their provisioning parks? Had it not, in order to make its way, a thousand paths open in the neighbourhood, and also by contact and the incessant relations of the French armies with the armies of the German countries infected with that malady?

I must mention here the remarkable fact which is recorded in the archives of the Bavarian and Wurtemburg administrations, and which was verbally confirmed by Professors Schwabb (of Munich) and Haussmann (of Stuttgard,) who were official witnesses at those epochs, to wit, that in consequence of the rigorous and energetic measures which were taken to prevent the propagation in these countries of the typhus, which was spread in their passage by the cattle which came from Hungary for the Austrian troops on the Rhine, it was only on the route designed by these two governments, as the itinerary compelled them, for those cattle, and the villages which bordered or lay in that route, that typhus declared and maintained itself while the war continued on the borders of the Rhine, in Swabia and the Palatinate.

In presence of these facts, recorded, as far as respects the movement of troops in the history of the wars of that period, and certified, as far as concerns typhus, by official documents and by ocular demonstration of competent witnesses, the false interpretation that has been attempted to be put upon them is sufficiently shown, and I believe I need not further insist on this point. Let me proceed to consider others better founded.

4. Professor Rodet has described, and, with him, other writers have cited, as an example of contagious typhus arising *spontaneously* in animals other than native of the steppes, the epizootic attack which prevailed in 1807 among the cattle of Eastern Prussia—namely, in the principality of Dantzic. Rodet ascribes this epizootic outbreak (*a*) to the great penury of the food of cattle endured during the preceding winter in consequence of the exhaustion occasioned in that country, the theatre of the war, by the passage and sojourn of Prussian, Russian, and French armies; (*b*) to the excessive fatigue which was imposed on those animals, which had become very scarce, for the ser-

vice of the transports, which was increased by the presence of those armies. He adds, that it was kept up by contagion and by the infection which resulted from the putrefaction of the dead bodies of animals, which no pains were taken to bury, or which were simply thrown into the rivers and ponds.

To suppose—which is nothing less than demonstrated from the description which he (Rodet) has given—that that disease was contagious typhus, it is clear that Rodet has gone elsewhere than where it was to be found to search for the cause of the epizootic disease. In effect it is certain, on one hand, that, in consequence of the great assemblage and movement of troops, both Russian and Prussian, which carried the war into Lithuania, Poland, and Eastern Prussia, typhus was introduced into those countries after the year 1805 by the convoys of cattle from the steppes, which always form the provision of meat of the Russian armies, and which at that time was, and still continues to be, the principal source from which the Prussian government draws its supplies of food for its armies. On the other hand, it is proved by the history of the wars, precisely at that time of which Rodet speaks, the French army, which was in want of provisions from the exhaustion of the country, was obliged, in order to procure corn and meat in sufficient quantity, to appeal to the Jews, who, "by the assistance of an adroit corruption, put to sleep the vigilance of the guardians of the *Austrian frontier*"* to allow the passage of provisions, of which they (the Jews) constituted themselves the providers. Now, everybody knows that beyond the Prussian frontier, on the side of Austria, there lies Gallicia, and that no other cattle than those from the steppes could arrive by this province.

Thus the infection by typhus of the cattle parks of the *corps d'armée* which carried on the siege of Dantzic, and of the greatest part of the country occupied by the French and combined armies of Prussia and Russia, had manifestly no other source than the contagion already previously brought into those countries by the oxen from the steppes, which abounded in the allied armies; and it results, from what I have just said, that if it did not then exist, it would certainly have been imported by the oxen from the same countries which the providers of the French army found means of causing to be brought by fraud from Gallicia. This is no example of typhus sprung originally from animals strangers to the steppes.

5. It is again from Rodet that the following is borrowed:—

This professor, then a veterinarian attached to the army, has recorded in one of his works, ("Medecine du Bœf,") not the description, but the indication of an epizootic attack of contagious typhus which, according to him, was manifested in 1810 in the environs of Madrid, in the province of La Mancha, and which was said to have extended to the mountains of the Sierra Morena, between Madrid and Alba de Tormes. "But," says he, "it found few victims from the small num-

* Thiers' "History of the Consulate and of the Empire."

ber of horned cattle which existed there." According to this author, "the inhabitants of the plains did not offer any opposition to the disease but by prayers and amulets."

"This epizootic attack," says Rodet, "could not be attributed to contagion brought by Hungarian oxen, since no horned cattle coming from abroad had for a long time been received in the Peninsula, and the French army at that epoch did not take any herds of oxen into the country which then furnished food to us in quantities more than we could consume. It is, then, very evident that it had its first origin in a new development, and that it was *exclusively spontaneous.*"

But in order to give to this fact all the value which can be lent to it, it would be necessary at first to make it evident that the disease of which Rodet speaks was really contagious typhus, and this appears to me to be very contestible. In fact, not only does this author avoid giving any details of the symptoms and *post-mortem* appearances of the malady, but he declares, that although no sanitary measure was taken against it, and although the inhabitants only opposed its progress with prayers and amulets, it slew very few victims. It is true that he attributes this small number of victims to *the small number* of horned beasts which existed in that part of Spain where the epizootic disease broke out; but I cannot help remarking a singular contradiction between that assertion and another made a few lines further on, where the author, to explain the absence and the inutility of the importation of foreign beasts, affirms that in the country which it occupied, the French army found cattle *much beyond what they could consume.*

With the knowledge of which we are now possessed of the rapidity and extent of the ravages made by contagious typhus in countries where it appears, we may be allowed to doubt that a disease which, abandoned to itself, made only a few victims in a country which was the theatre of war and so rich in cattle, was really contagious typhus.

How was it, besides, that if this typhus really existed, Rodet was the only veterinary surgeon, not only French, but Spanish, that observed it—the only one who speaks of it? It is assuredly a malady sufficiently disastrous, that the memory of it, at least, would be preserved in the countries which it had afflicted. Now, after having made researches in all the Spanish works in which mention is made of the maladies of bovine animals—after having obtained by official means leave to search the archives of the agricultural and sanitary administration of Spain, I have not found anything which alludes to typhus attack on horned beasts in 1810. On their part, all the professors of the Veterinary School of Madrid declared to me, in a collective note, drawn up by them in reply to a series of questions which I addressed to them, that in no part besides the work of Rodet is there any mention of that epizootic disease. I must add, that it would be very strange if in that war for independence which endured from 1808 to 1814, and which raged throughout all the Peninsula, that in 1810, and in a single province of Spain, the typhus should

burst out, and that precisely where were the cattle of the French army, which had no parks of cattle for provisioning, and lived upon what they found in the country, while it should have spared the parks of the English army, which, following their usual practice, never marched without being followed by numerous herds of horned cattle. I must remark, besides, that that would have been much more surprising, as it appears from official documents which have been furnished to me by the Minister of Finance at Lisbon, that in consequence of the exhaustion of food in Minho and Beira, which are provinces that most abound in cattle, and which besides were occupied by the French, the Portugese Government arranged for the importation from Morocco of cattle necessary to form the parks of cattle which followed the Anglo-Portuguese army. It was, therefore, these expatriated animals which formed a great portion of those parks, and the hard vicissitudes of war imposed great fatigues upon them. Moreover, it is stated in a memoir, addressed to me by the body of professors of the Veterinary School of Lisbon, that at no time was contagious typhus observed in Portugal.

My belief, I may say my conviction, is, then, that Rodet, and those who have borrowed this fact from him, are completely deceived in regarding as contagious typhus the epizootic disease which he observed in the environs of Madrid.

6. A more considerable objection has been made by Professor Carlo Lessona to the opinion of the exclusive origin of typhus in beasts from the steppes. This is it :—

"An epizootic disease in large cattle afflicted Egypt from 1841 to 1844. It carried off more than 400,000 animals. The descriptions which were given of it by veterinary and other surgeons place beyond doubt that it was *contagious typhus*. Now Egypt not receiving any cattle from the steppes, nor yet from Germany, it is evident that that malady owed its development in those animals to the natural disposition which all *animals of the bovine species* have to contract it under the influence of general causes which produce it."

I acknowledge that it was likely to be contagious typhus which prevailed in Egypt from 1841 to 1844; but the numerous and important documents collected by myself on that disease, if they are not a rigorous demonstration of its origin in animals coming from the steppes, they suffice, at least, to establish the gravest presumptions in favour of that origin, and in any case render evident that it was not in Egypt, not from bovine cattle from that country, that the malady derived its origin. The reader may judge of that by what follows :—

"In 1840, the Viceroy having divided the greater part of the territory of Egypt into appanages for his children and the high civil and military functionaries of his government, and reserving for himself vast properties, the necessity of giving to the culture of the earth a greater activity was felt. But the number of beasts proper for labour, and, above all, for the irrigation of the soil, being insufficient,

it was imperative to procure more from foreign countries. For this purpose the Viceroy, his son Ibrahim, and several other great proprietors, sent agents into *Anatolia* and *Karamania*, countries which by their proximity, the quality, the quantity, and the price of the cattle which they furnished, seemed to offer the greatest advantages. Numerous purchases were made there during the winter of 1840 and 1841, and considerable herds of them were collected for embarkation in the towns of Adana, Tarsons, and Kazanli. But *before* their embarkation a destructive epizootic disease broke out among them, and caused the death of a great number of them. Instead of abandoning those animals to the disease which decimated them, efforts were made to send them off to Egypt towards the close of the spring of 1841. As might have been easily foreseen, the disease continued on board the vessels in which they were conveyed, and during their transport it became necessary to throw many of them into the sea. As to those which survived, they were landed at Alexandria in a generally deplorable condition. This transportation was carried on for the two following years under the same circumstances, with the same accidents and the same losses. Now the disease, far from becoming milder, seemed, on the contrary, to increase in intensity after the landing of the animals at Alexandria, and therefore their proprietors hastened to scatter them in surrounding plains, hoping thereby to diminish the chances of mortality. But this was not the case; the animals carried everywhere the germs of the malady which had already caused the death of a great number, and spread it among animals of their species in every place into which they penetrated. From thence the contagion extended rapidly into Lower Egypt, the Delta, and penetrated even into Upper Egypt, attacked also the buffaloes, and caused three-fifths of the horned cattle to perish; and it made such ravages that, contrary to the practice in that country, they were obliged to make use for agricultural purposes of horses, asses, mules, and camels."

The passage which I have just transcribed is an extract from an official report, dated the 29th of April 1847, addressed by M. Adolphe Barrot, consul-general of France at Alexandria, whom the Minister of Foreign Affairs had ordered to draw it up, upon the contagious typhus which was raging in Egypt, from the most complete and precise information which could be procured. I add that what they experienced accords entirely with the numerous documents which were transmitted direct to me, at my request, by our learned countryman, Dr Clot Bey, then inspector-general of the health service at Cairo, and by the president of the General Council of Health of Egypt; they concur entirely in their *exposé* of facts, with the writings, *de visu*, upon this typhus, by MM. Labattist and Ackmarvi, professors of the Veterinary School of Choubrah; by the Egyptian doctors Deheo and Allasia; and, finally, with the notes and observations made by MM. Ibrahim and Ismail, Egyptian Veterinary Surgeons, who sent them to me.

Thus, and in the etiological question which I seek to clear up,

there is one fact of great importance: it was not in the oxen of Egypt that this typhoid epizootic disease of 1841-1844 had its origin; it was in the cattle bought in Syria and Turkey, and that it was to supply extraordinary demands that they were imported into Egypt. It was not even during their voyage that the disease showed itself, it was in Syria, *before* their embarkation.

Whence came those animals?

According to documents received from the Egyptian administration, not only were they received from the interior of Anatolia and Karamania, which furnished a great number of them, but they were procured in Roumelia, *from the banks of the Danube, and from Moldavia.* Now I hasten to remark that the greatest number of the oxen of Moldavia belong *to the race of the steppes;* and what proves that some oxen of that race were introduced into Egypt at that time, is the following passage from a note addressed to me by M. Ismail, the Egyptian Veterinary Surgeon:—

"In 1843, in consequence of the disasters occasioned by contagious typhus among the horned cattle of Egypt, there were brought from abroad and from *Southern Russia,* I believe, herds of cattle, which arrived by the Mediterranean. I was in Alexandria when they were landed. They were of the middle size, and their proportions were irregular, their bodies gross and thick, the head strong and large, their muzzles of a slate colour, their napes furnished with strong hair, the back and loins short, slightly arched; their horns were long in the majority — short, however, in some of them; their chest short and lank, the members strong, the tail hanging low, gross and furnished with long and strong hair. The dominant colours of their hair was what is called *light mouse colour* and *slate colour;* never red or bay. What is very remarkable is that on all the length, and in the middle of the dorso-lumbar line, there are hairs of varied length, forming a train from the withers to the tail. Some also had similar hair under the belly, on the jaws, and on the buttocks.

"It was not the first time, I may state, that I had seen cattle of that breed. *I had already had occasion to see such beasts—eighteen months before—in the farms of Ibrahim Pacha, son of his Highness the Viceroy of Egypt.*"

Now all who know the cattle of the steppes, will admit that there could not be a more faithful portrait of them, nor one more complete and characteristic, than that which was thus traced by M. Ismail; and there can be no doubt in their minds the animals introduced into Egypt in 1843 were of that race. I must remark that certainly cattle of this species entered that country at anterior epochs, since eighteen months previous M. Ismail had seen such cattle in the cow-houses, and in the fields of Ibrahim Pacha, which, probably, had been there for some time when M. Ismail saw them.

I can well understand that this fact of the introduction in numbers of oxen from the steppes into Egypt, in 1843, not more than the

probable importation of some animals of that race before that period, has no principal importance at least in etiologic relation with the history of the typhus of 1841, since it is certain that it was not in Egypt that the typhus disease originated. Nevertheless, I have thought it my duty to establish clearly the fact, in order to prove that it was not so inadmissible as Professor Lessona thought, that Russian cattle were ever imported into those countries. I have just said, in effect, that solely on that inadmissibility, and invoked by others since, reposes all the argumentation of the Piedmontese professor respecting the origin of this typhus.

But I believe I ought to state here, in order to demonstrate that it is not impossible that this disease may have had its source, its primary origin, in the race of the steppes, for there are many means afforded by commerce and importations for contact between these animals and those of Anatolia and Karamania.

In fact, it is stated in a Russian document officially transmitted to the Minister of Foreign Affairs in France, on the subject of the countries of the steppes and the animals which are produced there :—"In the governments in which the steppes are situated there are reckoned to be 6,000,000 cattle which are raised for slaughter. These animals are with that object sold in Russia, Poland, Germany, *Anatolia, Karamania,* and even in *Syria.*"

Now, it must be remembered that it was from Anatolia, Karamania, and Syria, that were taken the herds of cattle which carried typhus into Egypt; if it is remembered that before their embarkation the beasts were attacked by that malady, not only is it not unlikely that those were animals from the steppes which had originally contracted that malady which they communicated to those of the country, but still more, if attention is paid to the fact that if it was not so, that epizootic disease would be, as to its origin, an inexplicable exception to thousands of concordant observations made in Germany for more than a century, no one can refuse to admit, until demonstration is afforded to the contrary, that such was the true origin of the typhus among the herds from Anatolia and Karamania imported into Egypt.

Such are, according to my knowledge, the only facts on which is founded the doctrine of the possible origin of contagious typhus in animals foreign to the steppes. I come, then, to determine its value in this point of view, and if I do not deceive myself, I believe they are very far from furnishing one single serious argument to the partisans of that doctrine.

However, desirous of finishing, once for all, with an opinion which in 1844 cost thousands of beasts to Bohemia—which is capable of being so fatal among us, and everywhere else where it is allowed to penetrate, and is dangerous on account of the scientific authority of the authors who profess it, I considered it useful not to allow to pass without appreciation any of the reasons given in order to make it prevail. I shall examine, then, in a few words, that which follows, in replying to M. Lessona, who, among others, has put this question to the adversaries of the system which he supports :—

"If any one denies that contagious typhus can generate spontaneously in bovine cattle of all countries and of all races," says this veterinary professor, "let him cite a single case in which oxen, (French or others,) strangers to the steppes, have been united, agglomerated in numerous herds, exposed to climatic influences, to privations, to fatigues, to hunger, as those are which follow the German armies, and have not contracted contagious typhus under the influence of these conditions."

To this question the reply is easy; and among the examples which present themselves in such numbers, I shall only feel embarrassed by the choice. I shall confine myself to citing the following, which I believe from their nature, from their historical evidence, from their importance, and from the clearness of their signification, must suffice to remove all doubts on the subject.

I have interrogated the history of all the countries of Europe—above all, those in which, directly or indirectly, it has treated of contagious typhus; I have inquired of the most competent persons, and those best placed in different localities, what have been the coincidences there; the relations near or distant among the wars in which they have taken part for more than a century, and the epizootic attacks from which their cattle have suffered, and their results, from the very precise documents which have been transmitted to me from almost all the states to which I applied, that whatever may have been the displacement of troops, the masses of men and beasts that have been put in movement by war, *never* has contagious typhus shown itself among the cattle in the provision parks of armies when those cattle parks were not recruited, in whole or in part, from the races of the Russian or Hungarian steppes, and when the beasts that compose them had no relations with animals of that race attacked with the malady, or with others infected by them: while there has not been a war of any importance in which Russia or Austria has taken part without, shortly after the commencement of the war, the typhus appearing and making great ravages among the herds of cattle intended for provision. Here we ought to recall the fact which is known to all the world, that the cattle which are made use of to sustain the armies of Russia are exclusively, or for the greater part, furnished from the steppes of the southern provinces of that empire; and that those which compose the parks of the Austrian armies come principally from the same steppes or from those of Hungary. This is the invariable conclusion arrived at from all my researches into the Russian and German archives, and all the documents, official and otherwise, that have been sent me. Thus, in my turn, I can, with good reason, return the question, and say to those who ask it:—

"If it is true that contagious typhus may originate spontaneously, not only in the race of the steppes, but also in others, let them cite a *single* war wherein French, Dutch, Spanish, Piedmontese, or English *oxen*, &c., however reduced by privations and imperfect nourishment, *however* harassed, however worn out with fatigue, however crowded

together in great numbers, have shown a single case of contagious typhus, if they have not previously been in communication with animals or places infected with this malady."

"Who can cite, on the contrary, the instance of a single Russian army of any size obliged to have parks of oxen drawn from the southern provinces of that empire, without the contagious typhus having shown itself very shortly after the army has been collected or put in motion?"

It would be superfluous to notice here all the typhoid invasions which have had their point of departure from the great movements of Russian and Austrian troops when the great masses of stock are divided from the Russian, Danubian, or Hungarian steppes. All the world agrees that these movements have generally for their consequence the development of typhus. But that which is sustained, and which I contest, is, that this same malady manifests itself equally on herds for provisioning armies or great agglomerations of oxen of other countries, if placed in the same conditions of emigration, fatigue, and privations. We have already seen by the analysis which I have made what is the value of the facts brought forward as proofs of that proposition: it will suffice, then, to settle this point, merely to cite some facts of a contrary nature, which, to render them more evident and more easy to check in all points, I shall borrow from a part of our history which is nearest to our time.

It is certain that from 1800 to 1814 France had great wars to support; she put in movement great armies, and, in order to conduct them to fields of battle far distant, where they were to fight, it was necessary to collect very considerable herds of cattle, while the preoccupations and the necessities of war did not permit them to give the necessary care with respect to the health of the animals. Well, up to 1814, so long as those armies did not quit France or the countries bordering on France—while they were not in contact with the armies of Prussia or of Russia, did these armies see their parks of cattle attacked by typhus? In no place was there any indication of it. But at corresponding periods, what passed among foreign armies? Prussia, of which the Polish frontier at first, then the eastern part, and afterwards the whole country, were continually occupied by Russian troops, was during that period of time so cruelly ravaged by contagious typhus, that the historians of that country do not hesitate to say that it lost more wealth, in consequence of that disease, than it suffered from the evils of the war. Now it was the same in all parts of Central Germany and the German states of the south where the Russian or Austrian armies had penetrated.

Starting from 1801, the theatre of war being removed from the Rhine towards the centre and the east of Germany, typhus, which had raged in the states bordering that river, while the Austrian armies sojourned and acted there, disappeared along with them. After they left, and up to 1813, however, these states being incessantly covered with bodies of French troops, that disease did not show itself. It

was not until 1813, then, when the hazards of war took the Austrian and Russian armies into the Germanic Confederation, that the disease came back along with them again; and it was in the year following, when France was invaded in its turn, that the numerous convoys of oxen which the Prussians, Russians, and Austrians brought in their train, that it carried off almost all the beasts wherever it appeared; and this continued up to 1816, when there were none of these foreigners passing through or sojourning among us, and which ceased when their armies quitted our soil.

If from the north we cast our eyes towards the south, and look to what passed in Spain then, we there see from 1808 to 1814, during the six years which the memorable war of independence lasted, Spanish, French, and English armies occupying and overrunning that, in every sense, unfortunate country, without contagious typhus once appearing, although fatigues and privations of all kinds were endured by the provision cattle which everywhere accompanied the English army; and particularly was this the case with those which were obliged to follow our (the French) troops, to whom hostile and exasperated populations refused the least succour.

It will be seen that these are facts of a signification difficult to be contested. Nevertheless, I can produce facts still more conclusive, considering that the time and the epoch in which they took place are almost before our eyes, and it is not for any person to ignore or misconceive them.

Every one knows what was, during the ten or twelve first years of the occupation of the French in Africa, our position in that colony; our armies, incessantly in action, either to conquer the country or to defend daily foot by foot the conquest, finding nothing to subsist on, being obliged at the same time to have great parks of provision cattle situated near the towns, and to send on a certain number of those animals every time that the columns, however small they might be, were sent on expeditions. Being unable to have more than a very restricted commerce with the Arabs, the localities occupied being unable to furnish meat in sufficient quantity, it was necessary to cause oxen to be brought from the nearest European coasts. Hence Spain, Sardinia, the Two Sicilies, and the Roman States provided what was wanted. No preparation was made to receive and lodge those great masses of animals, which were left without shelter, exposed to the severity of the weather in a very dangerous climate, in enclosed places of which the soil was generally so humid and muddy, that when it rained the animals, which had scarcely room to move about, sank up to the knees in water or mud. Negligent, little attentive, or more guilty still, the agents appointed by the administration to take care of these animals did not give them sufficient food at all times. Thus diseases frequently broke out among them, and the mortality was considerable. These diseases were serious diarrhœa or attacks of dysentery, sometimes watery cachexia: here anthrax affections, there acute or chronic affections of the chest, which ravaged the cattle

parks and caused a great number of animals to perish. Notwithstanding, according to the official report of all the veterinary surgeons who succeeded each other in Africa from 1830 to 1845, and also from declarations of military intendants and sub-intendants, who were invited specially by the minister to make researches upon this subject, never did contagious typhus show itself in the indigenous cattle, nor yet in oxen imported, placed in the deplorable position which I have just mentioned according to the official communications which have been made, at my request, by the war administration.

As to the cattle for provisioning the expeditionary columns, the condition in which they were placed was still more miserable, as may be judged from the following extract from a report furnished by twenty-nine veterinary surgeons, *all agreeing on this point*, of which I have the memoirs before me:—

"The cattle which followed the troops in the expeditions vary in number, according to the strength of the expeditionary division to be provided for and the presumed duration of the campaign. These animals lie constantly on the ground and without shelter, occupying a place in the neighbourhood of the square formed by the troops. There is no ration of forage; they have only to eat and drink what they can find on the route, whether on halt, in camp, or in the environs of camps, when there is no reason to fear that the Arabs may carry them off. They have, consequently, great privations to endure, very great fatigue to go through, according to the season, following the columns everywhere with more or less rapidity over roads generally difficult, and where accidents frequently occur. Thus during the summer, the excessive heat which dries up the very sources of the streams, withers the plants that furnish forage, obliges them to travel with their noses in the sand, to breathe a burning air, without water to quench their thirst, without other aliment than dry and coriacious roots, which they may find by turning up the earth. During the winter they have to endure a cold sometimes excessive, and rain and snow which at that period fall with an abundance which is not known in France. It must not be matter of wonder that many of these animals die during or immediately after these expeditions, nor that they sink, thin and meagre as they are, under the grave maladies which attack them. Among those maladies the most grave are diarrhœa, fevers, and those of an anthrax character. But never have my colleagues or myself seen or heard it said that any case has appeared of contagious typhus, or other affections transmissible from diseased animals to those in good health, among which they are replaced after their return from an expedition."

Assuredly if expatriation into an unhealthy climate, if privations of all kinds in already attenuated animals, of hunger, thirst, forced marches, the prolonged want of drink and forage under a burning sun; if exposure night and day to rain or to snow during frosty nights, &c., could, as some affirm, cause typhus to make its appearance among all horned animals without distinction, and of any race

—assuredly, I say, no circumstance is more likely to produce it than those to which we have exposed, for fifteen years of a war without relaxation, herds of cattle stationary or on march, destined to provision our African armies. Now, I repeat it, a special inquiry made with the utmost care in 1845, throughout all the extent of our possessions in Algeria, and of which all the proofs are now before me, has established the fact that at no epoch since the origin of the conquest has any case of that affection been proved in those animals, oppressed and decimated as they were by so many other maladies.

I could without any doubt stop here relative to that capital circumstance in the history of typhus, if that malady had never been generated in times of war and under the influence of conditions of extreme exhaustion in which animals live that follow armies. But any person who has studied the history of the invasion of contagious typhus in neat cattle must know that the same circumstances of expatriation, of misery and fatigue, in which a state of war places cattle intended for provisioning armies, are to be found among animals of the race of the steppes, which every year, in perfect peace, to the number of hundreds of thousands, are bought in Southern Russia, and driven to the north-east of that empire into Poland, into several provinces of Austria, and into Bohemia, to supply the requirements of the butcher. On the other hand, whoever has read good German and Russian authors who have treated of typhus, and particularly of the excellent monographies of Lorinzer and of Spinola, knows that during a great part of the year more than 100,000 of those animals plough up the almost impracticable roads which lead to the Crimea and Bessarabia, to Podolia, Volhynia, and to other provinces of the north-west and centre, attached to carts which transport into those countries the salt which is furnished in great abundance by the saline springs of Lower Bessarabia and Perecop, and which on their return take to Odessa the corn raised in those fertile provinces.

Now, it has been demonstrated by the learned German veterinary writers whom I have just cited, and it is now perfectly well known, that the manifestation of typhus which takes place so often in times of peace, whether in Russia, on the Russian frontiers of Poland and Germany, in oxen from the steppes which are taken for slaughter, or in those employed for transport, had generally for principal determinating causes the climates, and the fatigues, privations, and exposures to which those animals were subjected on the long routes on which they travelled.

Thus this fact has been laid hold of to attribute to these circumstances exclusively the development of the malady in these animals, and to affirm that if cattle of other countries had similar distances to go with the same regime, overcrowding, and fatigues, they would without doubt be attacked with contagious typhus.

It is true that this is only a simple affirmation, based on a belief purely theoretic, and that is warranted by no observation. It is as well to demonstrate here by an example chosen from among several

others, that oxen, when they are strangers to the race of the steppes, when they find themselves in similar conditions to those which I have just related, may be more or less decimated by maladies, but do not contract contagious typhus. And here I shall give a proof of it which appears to me unanswerable.

"Egypt raises few cattle, and the number which she does raise is insufficient for her wants. She supplies them by numerous importations, coming, for the greater part, from Kardofan and Senaar. These importations are made by convoys, the mean cipher of which may be estimated 1500 to 2000 head; but, whether from negligence, or from that spirit of apathy and want of foresight which characterise the people of Eastern countries, it is very rare that on the departure of these convoys the agent who is charged to preside over them has calculated on the supplies which he may need on the immense line he has got to traverse, sometimes 400 or 500 leagues. Setting out from the farthest part of Upper Nubia, these convoys travel towards Egypt by keeping as much as possible by the sinuous banks of the Nile; but often they are obliged to go off from them, and then, as before reaching them, their route is traced across long stretches of the arid desert. In these marches, in which the distances are far from being calculated according to their strength, these animals, born amid the luxuriance of a tropical vegetation, suffer almost without palliation and without intermission the effects of the sudden contrast. They quit a land rich in herbage for another of burning sand. To repose and fat pasturages and abundance of pure water, succeed, for them, a dry atmosphere, long journeys, fatigues, and privations.

"The halts are made in bad confined places, where a meagre provision of beans and straw, when they can find it, forms almost the only resource which can be reckoned upon to feed and sustain them. For as no one has foreseen either the number of the convoys or of the beasts, nor even the precise epochs of their passage, it happens often that the mass of provisions is much less than will be strictly necessary; and this happens particularly when this kind of halting park, these *chounes*, (as the Arabs call them,) are at a little distance from the cultivated spots. Thus the misery of the convoys increases in rapid and frightful progression, reaching its height precisely in those places the most deprived of natural resources, in which for that reason the most ordinary providence would have prepared and economised the most to meet it.

"According as they go farther from the point of departure and fertile spots, these convoys mark more and more their passage by the bodies of the dead oxen which at short distances point out the road they have gone along; and when at last they approach the end of their journey, the convoys are stopped near Cairo, it is not a rare occurrence to find that their numbers are reduced by a third, a half, or even more. As to those which survive, they are, for the most part, very meagre and in the most pitiable condition.

"The disease which falls most frequently upon these beasts, and

that which destroys so great a number, is dysentery, complicated in many of them by bilious affections; *but never did any one see that malady or any other assume in these animals, and in these circumstances, the typhoid character. Never has it had the slightest contagious character.*"

The statement which I have just cited is extracted textually from a letter written to me by the present honourable director of the Veterinary School of Toulouse, M. Prince, who drew the facts from the notes collected by him during his sojourn in Egypt, where he occupied for several years a professorial chair in the Veterinary School of Choubrah.

Can I add to its significance? And by what example more striking can I prove that the expatriation, that conditions of march and of regime the most miserable do not suffice to produce contagious typhus in the bovine race? That it requires also in those animals, in order that that malady may germinate and engender in them a predisposition, a special aptitude, which, up to the present time at least, is only to be met with in the race of the steppes?

The Veterinary Review and Stockowners' Journal.

›N THE INVESTIGATION OF EPIDEMIC AND EPIZOOTIC DISEASES.

'OREMOST amongst the great evils which afflict mankind, and hinder he prosperity of nations, are those scourges which from time to time weep over the earth, spreading want and misery and death around hem; those epidemic and epizootic diseases which we are only now ommencing to study in their proper light, to trace to their proper ıuses, whose prevention and extirpation it will, we trust and believe, e one of science's most useful tasks to achieve.

Our epidemic and epizootic diseases may be all classed under the 'oup to which modern nosologists have attached the name "zymotic;" name which, although it involves a theory which may be, and prob- ›ly is, incorrect, (*i. e.* that they are due to fermentation,) serves to :mind one of the characters of the diseases which belong to the ass, diseases which appear to be all due to special morbid principles, e these definite chemical substances, be they certain special condi- ions of organised matter—morbid principles which, when placed ınder favourable circumstances, have the power of multiplying to an lmost indefinite extent. When we examine and study specially that livision of zymotic diseases which our Registrar-General includes under he order miasmatic—which comprehends the very diseases which in- erest us at present—our typhus and cholera, our rinderpest and epi- ;ootic pleuro-pneumonia, we find that whilst, like the other zymotic liseases, they appear to be caused by special poisons, they are sus- ;eptible of communication from an affected person or animal to the ıealthy by means of the air, or water, by fomites, that once generated in ı diseased organism, the poison can, through the means of one or other, ›r all of these channels, be transmitted from the sick to the healthy. Enveloped though they are in comparative obscurity, their virus only

known to us through its effects, there are certain facts connected with these diseases which ought to be studied more than they have been, and a proper knowledge of which may lead to our being able ultimately to extirpate, or, at any rate, to confine them to certain limited regions.

That the special morbific principles which give rise to each of our zymotic diseases must, at some time or other, have originated spontaneously is very obvious. That when a certain group of circumstances favourable to its genius exists, a zymotic disease may be generated anew, we presume no one would doubt, though at the same time all must maintain that such an association can only very rarely be admitted to be possible. Perplexed though we may be with regard to some of our zymotic diseases, in doubt as to whether our typhus and typhoid fevers can be generated afresh or not, we can have no doubt in saying that the immense majority of our zymotic diseases cannot originate spontaneously in our climates. Climate and geographical position influence to a remarkable extent the generation of many, and modify or control the spread of others of these diseases. That the virus of small-pox may, in certain parts of the globe, originate *de novo*, we not only believe to be possible, but probable; but that such a generation never occurs in our climate, is a fact so fully admitted by all as to require no arguments in its support; and the same is true with regard to many others of the zymotic diseases which are endemic in Great Britain. The same is certainly true with regard to the cholera and the rinderpest. So essential a condition, indeed, is that of climate, not only to the generation, but to the spread of some of the zymotic diseases, that they are only capable of existing within certain latitudes, beyond which the poison upon which they depend seems to cease to be capable of reproduction. Of this fact we had an instance but a few weeks since in the limited epidemic of yellow fever which occurred at Swansea. Introduced by a vessel arriving from the tropics, this disease caused the death of several persons who came in contact with the crew of the infected vessel, and of others who had thus contracted the disease. Yet no great alarm existed in the mind of the medical profession as to the disease extending, so well known was the fact that a tropical climate is one of the circumstances essential to the continued generation of the virus of yellow fever.

We have alluded to small-pox, which is an example of a disease which, although endemic, is incapable of spontaneous generation in our climates; and to yellow fever, which not only cannot be gener-

ated in our climates, but which does not find here the circumstances essential to its continued existence; and we have now to examine certain points connected with the history of cholera and rinderpest. If yellow fever has its habitat, cholera and rinderpest have one likewise, for there are regions which they almost continually devastate, and from which they only occasionally are wafted to us, to rage only for a time perhaps, but long enough to cause the most terrible havoc. The first duty, then, of scientific men, is, if possible, to study the regions of disease accurately; and the duty of a wise legislature will be to act upon the strength of this knowledge, and to oppose all possible barriers to their extension from these regions. It will be their duty to have a sanitary police watching over the health of the people, and studying the march of epidemics.

It is now two years since we drew the attention of the stock-owners of Great Britain to the extraordinary prevalence of the rinderpest in certain districts of Austria and Russia, and we showed how great was the probability of the disease being transmitted to our shores, and pointed out the dreadful consequences which must necessarily attend its introduction. But our predictions, and the measures which, believing in them, we proposed, only served to awaken the opposition of those whom they were most intended to benefit. That the measures which we suggested would have had the effect of stopping the introduction, we think few will be inclined to doubt. The history of the rinderpest epizootic teaches, indeed, a valuable lesson respecting the short-sightedness of not impeding, in every way imaginable, the march of those diseases which science has already taught may be, by suitable measures, restrained in their march. That other nations are more alive than we are to the importance of such measures is proved by the welcome fact, that within the last few weeks the French government has proposed to the other European governments that a Sanitary Diplomatic Conference on Cholera be held, and the proposition has already met, we believe, the approval of those to whom it was addressed. The terms in which the invitation is worded proves how philosophical a view the French government has taken of the matter. "The object of this conference would be to investigate the primary causes of cholera, to determine its principal points of departure, to study its characteristics, and its march; lastly, it would have to propose practical means for confining the disease, and stifling it at its origin."

Let us hope that this congress will inaugurate a new era in the his-

tory of sanitary science, by showing how great are the resources of science, and how inestimable the boons which she can confer upon humanity.

If we have, amongst the points to be investigated in connexion with epidemic and epizootic diseases, chosen as most important that relating to their origin and spread, we have done so because we consider that its study will have the greatest practical results, and that its solution is of chief importance. Yet we are perfectly alive to the fact that much light may be expected to be thrown by science upon nearly all the questions relating to these diseases. In our next we intend to continue this subject, and to show the special benefits which a proper study of hygiene may confer, and the special points which chemistry and pathology are likely to solve.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF COUNCIL, HELD OCTOBER 4, 1865.

PRESENT—The President, Professor Gamgee, Messrs J. C. Broad, Brown, Dickens, Vines, Field, Greaves, Harpley, Harrison, Hunt, Hunting, Lawson, Moon, Pritchard, Secker, Thacker, Withers, and the Secretary :—

The President in the Chair.

The Minutes of the preceding meeting were read and confirmed.

A letter was read from Mr J. C. Broad of Paddington, acknowledging his election as a Member of the Council.

The Secretary informed the Council that a meeting of Inspectors, appointed by the Government within the metropolitan district, for the suppression of the cattle plague, had been held on 21st August, at the Royal College of Veterinary Surgeons, at the request of Professor Simonds, and under the sanction of the President, for the purpose of discussing certain important points relative to the duties of Veterinary Inspectors, and the arrangements of their districts. There were present—the President, Professor Simonds, Dr Williams, Messrs Broad, Brown, Boughton, Boulter, Cheeseman, Cowie, Cross, Dale, Drake, Farrow, Hancock, Helmore, Lowe, Moon, Moss, Priestman, Skelton, Stanley, Tegg, Woodger, and the Secretary.

The President informed the Council that he had ordered 1000 copies of the County List of Members of the Body Corporate to be printed and circulated amongst the Magistrates of the United Kingdom.

A letter was then read from Dr Struthers, relative to the rejected candidates at the recent examinations, who hold the Highland and Agricultural Society's Certificate. Dr Struthers stated "that he was unable to answer the inquiry."

The work, "Oliphant's Law on Horses," as ordered by the Council, was laid on the table; also two works entitled "Aquapendente Opera," and "Snape's Anatomy of the Horse," which were presented by the President, Professor Varnell, to the Library of the College.

It was moved by Professor Gamgee, and seconded by Mr Ernes, "That the thanks of the meeting be awarded to the President for his valuable contributions."—Carried unanimously.

A letter was read, which had been received from Mr George Scott of Kentish Town, now holding the Highland Society's certificate, who was desirous of becoming a candidate for the Diploma of the Royal College of Veterinary Surgeons, at the next meeting of the Court of Examiners. It was moved by Mr Lawson, and seconded by Mr Hunt, "That Mr Scott be informed that he will be required to conform with 'Bye-law No. 27,' and that the examination of pupils for the diploma will take place in the week before Christmas."—Carried.

The Registrar reported the following deaths—viz., Mr Anthony

PERISCOPE.

VETERINARY SCIENCE IN THIS COUNTRY, AND ITS NEW COLLEGE.

A Close Observer of His Species has drawn a distinction between man and the quadrumana, which is, perhaps, the only one that will bear investigation. It is founded upon the fact that, while each ape depends upon his own individual experience alone for his amount of knowledge, his superior in the scale of creation has the advantage of the accumulated wisdom of his predecessors; and this remark may be extended to the various professional sections into which mankind are divided where there is any great difference in their antiquity, for surely it is impossible to derive advantage from the experience of the former professors of a calling which has only recently been called into existence. Now, veterinary science has this drawback, having risen into being during the present century, and for this reason it is not fair to compare it with human medicine, which can refer to the works of numberless physicians and anatomists down to the time of Hippocrates, who lived five centuries before the Christian era, and who, again, was himself enlightened by the then existing writings of Esculapius. The professors of veterinary medicine have their work still to do before it can take its proper place; for assuredly little has as yet been done in this country to entitle it to be considered a science. They have not yet given us a reasonably good manual of the descriptive anatomy of our domestic animals, far less the physiology of their tissues, without both of which students of the art must be continually at fault, and much progress cannot be expected from them. Hence we hail with satisfaction any promise of improvement, and especially so that offered by the New College of Veterinary Medicine at Bayswater, which was opened on Monday last by Professor Gamgee, who is undoubtedly imbued with that zeal and enthusiasm which are necessary to all progress over untrod ground, and without which Harvey, Hunter, and Jenner would have been starved into silence.

One subject, the cattle plague, naturally presented itself to Professor Gamgee as of pressing importance to his hearers, and of vital interest to himself, inasmuch as he has taken a leading part in its discussion, and to this we shall presently allude. But there was another which we were much pleased to find occupy an almost equally prominent position, namely, the prevention of disease among our domestic animals as being of far more importance than its cure. Those who know anything of the secrets of the medical profession must be aware how difficult it is to persuade parents and other persons who have charge of large masses of children or adults to take measures to prevent disease. When it has actually been brought into existence they are ready enough to call for aid, but nothing short of the perseverance of Dr Jenner in advocating vaccination as a preventive of small-pox; or of Mr Chadwick in showing the importance of efficient drainage in dispelling fever and cholera, would have achieved their objects; and it is highly probable that, but for the advent of the latter disease in 1832, we should never have had the Health of Towns Bill passed into an Act. Practical men—as it is the fashion to call those who have a due regard to their own purses—find that it does not pay them to teach future generations, and the best of them are content with doing what they can to improve the health of the present. There is also an admission of inefficiency when the professor of the art of healing either men or cattle allows it to be known that he is not capable of doing that which his patients demand from him, and which his very title implies, so that it is no wonder that few like to do what Mr Gamgee has long done, following the footsteps of his father in holding out the superior advantages of prevention of disease as compared with its cure. Let this maxim be fully carried out at the Albert Veterinary College, and it will merit the support of the landowner and farmer, if it does not obtain all the pupils who are studying the veterinary profession in London.

With regard to the cattle plague, as might be expected, Professor Gamgee dilated upon the truth of his own views of that terrible disease, and specially upon the two chief questions involved—viz., its origin, and the best mode of getting rid of it from our herds and flocks. That he foretold its introduction into this country from Russia two years before the disease appeared in England, is undoubtedly a strong argument in favour of the truthfulness of the theory which he supports, and, if this is admitted, of his own skill; but it is no convincing proof, to our mind, and the evidence which has lately been published that there was no rinderpest in the province from which the celebrated Revel cargo was imported, strengthens the negative evidence so materially

as to make us pause before we admit Professor Gamgee's conclusions. This point, however, is not of pressing importance at the present moment. Unfortunately, we have got the disease among us, whether imported or self-generated; and we have first to consider how best it can be removed, and then it will be the time to ascertain the surest means of preventing its reappearance. Wholesale slaughter, or "stamping out," as this method has been forcibly called, is opposed at first sight to every scientific mind, and nothing but a conviction of the unmanageable nature of the disease would have induced us to modify the opinion which we last week expressed as adverse to it. We must, however, remember that we are not now dealing with animals over whose life we have not full power, and it is on that account idle to reason from man to them. In many instances it would, to our finite comprehensions, be merciful to the individual human being to put an end to his or her sufferings by a full dose of opium, as in the case of cancer and other malignant diseases, which often produce years of agony before they cause death; and it might, perhaps, be alleged with truth that the immediate destruction of every one attacked by an infectious disease dangerous to life, would in the long run diminish the mortality from it, and at length "stamp it out;" but such a proceeding is forbidden by all laws, human and divine, and cannot be thought of for a moment. In our domestic animals, on the contrary, we have only to consider the question from a commercial point of view, and if it can be shown, as Professor Gamgee says it undoubtedly can—first, that serious cases of the cattle plague are absolutely incurable; secondly, that the average mortality is 90 per cent. of those attacked; and, thirdly, that it is so highly contagious as to cause almost every healthy beast in contact with a diseased animal, or with its *exuviæ*, to be infected, we are shaken in our opinion. But whether he is right or wrong in the conclusions which he has arrived at from the evidence of facts patent to all, we can see no grounds for following the example of the editor of the *Times* in his article on the subject of Professor Gamgee's address published on the 5th instant. The contrast therein drawn between the attitude of the public towards the human and veterinary medical professions is by no means justified. Can the former claim any greater mastery over cholera than the latter is entitled to over the cattle plague, in spite of its experience during the three visitations with which this country has been afflicted? Preventive measures are absolutely all that can be relied on; and whether we adopt the saline treatment, or calomel and opium, or homœopathic doses of arsenic, the mortality in severe cases will be the same, as has again and again been proved in actual practice. The fact is really as stated by Professor Gamgee, that when the mucous membranes lining the stomach and bowels are either disorganised, as in the cattle plague and the malignant scarlet fever of man, or devitalised as in cholera, no absorption of salines or other medicines takes place, and death of the rest of the body follows as certainly as of the lobster when he has been so far acted on by boiling water as to turn his shell red, although his muscles continue to act. It is a strong symptom of ignorance in the physician to refuse to admit his want of remedial power over certain diseases, and, on the contrary, it will generally be found that the more skill and experience he possesses, the more ready he is to allow that, while he can assist nature to a very considerable extent in the majority of diseases, there are unfortunately but too many over which he has no control whatever. It is hard enough to be obliged to confess ignorance after years of study, but it is doubly hard for the veterinary surgeon to be told in the leading colums of the *Times* that "he has fallen into disrepute, because, by his own confession, he is absolutely useless in the presence of disease, and because, avowing himself unable to cure it, he would resort to the most reckless measures in order to avoid its contagion." We cannot always agree with Professor Gamgee in his conclusions, and we have sometimes thought that he rides his hobby somewhat too hard, but, nevertheless, he stands forth as the most scientific man in his profession, and certainly he cannot be accused, in the instance of the cattle plague, of either idleness or delay. He was the first to warn us of its approach, and to tell us, without circumlocution, of its arrival among us. He has undoubtedly worked hard in the examination of its symptoms, its treatment, and its pathology, and when he says, in opposition to his own pecuniary interests, that all he can advise is to put an end to its dissemination by wholesale slaughter, we surely ought to be grateful to him for his candour, instead of twitting him with his uselessness and ignorance.—*The Field.*

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